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WETTERS SHORTHAND REPORTING CORPORATION (916) 362-2345

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Natasha Nelson, SAFS; Environmental Office

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Joseph Loyer, SAFS; Air Quality Unit

Chris Tooker, SAFS; Policy, Planning and Admin.

John Kessler, SAFS; Environmental Office

ALSO PRESENT

Will Walters

Aspen Environmental Group

ALSO PRESENT (Cont.)

Steven Evans  
Friends of the River; Conservation Director

Audrey Chang  
Natural Resources Defense Council

Jane Turnbull  
League of Women Voters

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## P R O C E E D I N G S

PRESIDING MEMBER GEESMAN: This is a workshop of the Energy Commission's Integrated Energy Policy Report Committee. I am John Geesman the presiding member of the committee. To the left is Commissioner Jim Boyd, the Associate Member of the Committee. To my right, Melissa Jones, my staff advisor. Joining us is Mike Smith, Commissioner Boyd's staff advisor. Mr. McKinney.

MR. MCKINNEY: Good morning, Commissioners and advisors, my name is Jim McKinney, I am Project Manager for the 2005 Electricity Environmental Performance Report. We have today and tomorrow four workshops spread over two days on both the general items within the report and then three special focus topics that I'll talk more about later.

Just a few logistical things before we get started. Staff will run through a series of presentations. I'll start off with an introduction and set up and then review the key points of our executive summary and then turn it over to various members of our team who will talk

about their specialty subjects in more detail.

We tend to run right through this. The Commissioners and advisors will often ask clarifying questions from the dias. For other commenters, I ask that you wait until after the presentations and then we will have people come up from government industry and then kind of general audience and other stakeholder comments.

For those of you listening in on the phone, welcome. Please use your mute button. We have had some bad experiences with background noise, especially for those of you using your cell phones in a car. So, we ask that you respect the atmosphere of the workshop here today.

I also have noted on our agenda that I have given an opportunity for the commissioners or Kevin Kennedy to make any opening remarks they may have this morning.

PRESIDING MEMBER GEESMAN: Kevin in the room?

(No response.)

PRESIDING MEMBER GEESMAN: On behalf of Kevin and the Committee, we will respectfully decline.

MR. MCKINNEY: I figured you might do

that.

With that, I will dim the lights a bit and get started here. This is the third time we've done the Environmental Performance Report for the state's electrical generation system.

The original legislation was under SB 110, I think that was passed in 1999. We did the first report under that statute. In 2002, Senator Bowen authored and got passed SB 1389, which is the Integrated Energy Policy Report, and that directs the Commission to integrate and synthesize a series of reports of various aspects of California's Energy System and infrastructure.

A couple of provisions of that act applied particularly to environmental aspects of our electrical generation system. One of these develops our Commission to develop policies that conserve resources and protect the environment.

The other, as I mentioned, directs us to prepare the IEPR as we call addressing major energy trends and issues, again, including but not limited to impacts on resources and the environment. I always leave out impacts to social communities, but that is part of the statute as well.

The first one of these we did was really the only stand alone environmental report that really looked broadly at the State's electrical generation system. 2003 was pretty much the same thing, but we added an in-depth look at hydro power.

For 2005, the Committee has directed staff and various parts of the Commission to take in-depth looks at five different environmental topics. Most of these papers and workshops have already been presented and posted. I think we are the last one, although climate change is still coming up.

As you can see, the Commission has really broadened the way it looks at and integrates environmental issues into different parts of our reporting requirements.

What is the EPR as we call it? It is a sub-report to the Integrated Energy Policy Report that our Commissioners will author ultimately. It is a systematic science-based assessment of the status and trends of environmental performance for all parts of one of the largest and diverse power generation systems in the world.

It is 60,000 MW, we have eight or nine



major fuel types. It is complex, and it is large, and we are working very hard to really try to understand all the bits and pieces. What we try to do in these reports goes well beyond kind of the classic thermal power plant generate air emissions and we will analyze those. We go quite a bit further because our system requires us to and the legislation requires us to.

It is a fact-based, science-based assessment. Within those facts, we identify issues and trends, and from time to time, we identify issues that we believe are right for policy consideration or further study.

For the 2003 report, some examples of issues that we thought were kind of right for policy action were the use of water for cooling for power plants in California, and our Commissioners did pass a policy changing the way that water would be considered in applications for new power plant licenses in California. We also had an element on hydro power effects and one on climate change as well.

When we talk about environmental performance, it is a series of measures or metrics that look at different things. One of the

classics is thermal efficiency, that is what is the rate in which the fuel content in our various thermal fuels is transferred to electricity.

Something that we do a lot is try to quantify and measure a series of environmental discharges and resource uses. By that, I mean we try to tabulate or quantify tons of emissions, pounds of emissions, tons and pounds of affluent acre feet of water, acres of land and natural habitats that are used for power generation.

We really try to track the rates of change and how these are evolving over time, and we catalog the pollution controls that are installed on many of the power facilities.

Environmental quality effects is a whole different ball game. That is where you track the emission discharges and uses of various resources and see how that effects the environmental quality in a given air shed/water shed bay or ocean. That is something that can be quite a bit more complex than just tabulating emissions. We do it a little bit here. That is a long term goal is to get up to that.

Environmental efficiency is a term of art that comes out of life cycle impact assessment

methodologies. What it attempts to do is measure a unit of environmental impact per unit of capacity or energy generation. It is something I like to use because it really helps us to think about how do you compare things that are generally apples and oranges, such as impacts to salmon in Northern California with air emissions in inner cities in Los Angeles or San Francisco or even Sacramento. It is something we are working on developing further.

This is our basic approach or methodology. Something I want you to keep in mind here is a sense of scale. We tend to fly very very high, and I will be making some very broad statements that may catch a lot of people by surprise because it runs somewhat counter to popular thinking. At a general level, I think that is true, the data shows it. It has really changed my thinking, but it doesn't always apply to specific plants or projects in different parts of the state, so that is something I'd like folks to keep in mind.

In addition to what I said earlier, we track various technologies and regulatory trends, so BARCT is Best Available Retro Fit Control

Technologies. SCR is the Selective Catalytic Reduction devices used to control NOx. ZLD is Zero Liquid Discharge, etc.

The assessments that we do are based on data generated by our staff here in-house. We have several big data bases that we use. We rely heavily on data from sister agencies at the state and federal level. We look to data and analysis from the scientific literature and from industry, and from what is called the gray literature from the environmental community.

One thing that this is not, it is not a compliance report. If it was, it would be one paragraph because by definition, every power plant operating in California does so in accordance with its regulatory permits. That is not what we are here to do.

What we are here to do is go beyond just a simple are people in compliance with permits or not, and really look at the environmental performance from a much broader perspective. My interpretation of the statute directing us to do that is that the legislature and the administration really want to know are the policies and regulations we have in place doing a

job they were intended to do. If you limit it to compliance, you will never answer that question. So, we go quite a bit further than that.

We also work very hard to go beyond the power generation facilities that are not within our jurisdiction. That is hard because our staff was assembled to look at the environmental issues associated with plants in our jurisdiction. So, as you all know, thermal facilities greater than 50 MWs, and that is generally gas and geothermal these days, but as I mentioned, our fleet is quite a bit bigger and more diverse than that.

For 2005, these are the major elements of our report. First is the environmental data request that I will talk about in a little bit. We also have four major supporting reports that are really in-depth looks at a variety of topics. These will be presented this afternoon and tomorrow, and so we take a hard look at California's electricity imports. We will do that this afternoon.

We also take a broad and hard look at ones through cooling impacts associated with our coastal facilities. Rick York will host that tomorrow morning.

Tomorrow afternoon, Melinda Dorin will host the workshop on avian mortality from collisions with wind turbines and electrocutions with power lines.

A fourth paper we presented as part of the Water Energy Workshop on June 21 which was assessing the changes in hydro power production from climate change in the Western US.

As I move into this, I just want to take an opportunity to thank the staff from the Environmental Office, from the Electricity Analysis Office and a lot of other offices that have contributed to this report. We work hard to do this and feel very good about this kind of quality of this years report.

I would also really like to thank the staff from Aspen Environmental Group. They really are becoming an extension of our staff capacities here, and without them we would not have been able to do the in-depth assessments we are doing this year.

One of the findings from 2003 was that we did not have sufficient environmental data to really look at the breadth of facilities in the way we thought the legislature wanted us to. With

that, we did an environmental data request and sent that out to a very large part of our power generation sector.

At this point, I'd really like to thank industry for the response that we got. It wasn't total, but on a capacity basis, we got 53,000 MWs which was about 80 percent of the total that we are looking at this year.

I know it was hard, it was extra work for a lot of the power producers, but again, I want to express my thanks. It was very good to get that kind of data. There were some rough spots in it. We need to tighten up and work with it. We had some problems with timeliness. There were some inconsistency with the quality, and to that effect, to help make it better in future years, this is the first of the policy options we would like to put forth for consideration by the Committee, which is to develop a rule making so we can have a more consistent approach as we look at this in the future.

PRESIDING MEMBER GEESMAN: Do you see a problem with the fact that, at least by my arithmetic, you had 240 facilities that did not respond?

MR. MCKINNEY: Candidly, yes, but we were pleased through a lot of direct contact, we got all of the major thermal facilities, most of the major hydro facilities to respond. A lot of the smaller ones were in the renewable sector or very very small power plants. As you know, there are a lot of 1, 2, 5 MW puppies out there kind of scattered throughout California.

For a first cut effort, I am satisfied, but we did not have the tools to go back and do any enforcement on the data request. That is one thing that we would like to have with the rule making, just to have a little more "umph" as we go out and ask for this data.

The methodology that we used this year, we worked very hard to use the data that we did get from industry, but again, due to some issues with timeliness and the quality control, we were not able to make full use of it.

To compensate, staff from our Air Quality Unit, specifically Joe Loyer, put together a very very in-depth data base that covers, again, all 61,000 MW of capacity that we have in-state. He did that based on the data bases available from the Electricity Analysis Office.



One of the things the Committee asked us to do previously was to really kind of come out of the clouds and fly lower than a state level assessment for everything. With this data set, we are able to do that, and some of the findings really surprised me. So, I am very pleased that Mr. Loyer spent the time that he did to pull this together.

We can now really look at differences between regions and technologies on a much more detailed level than we were able to before, and we also took a first cut at developing a data base for out of state power so we can start to understand the environmental profile of that sector.

These are our findings for the 2005 report. In general, the environmental performance for our state's power generation system is very very good. When you think about the way electricity is generated in other parts of the country or the world, we have a relatively clean resource mix, and I think our footprint is quite small, and I think we should all feel good about that as a result of a lot of hard work by regulators and by the legislature in the different

policies that we have.

The key reasons for that is that we switched over to natural gas in the 70's and 80's, that is the cleanest of the fossil fuels. We have a very diverse mix of fuel types, and we have a very very strong air emissions regulatory program, and we are really seeing the results pay off from that.

There are some real success stories out there, air emissions continue to go down from the power sector. They continue to become cleaner. The way water is used for power generation also continues to improve. Again, we had a major policy from the Commission two years ago furthering that.

For terrestrial biological resources, I think the combination of SEQUA and the Endangered Species Act and the way our staff and other agencies look at these issues, it also means that we are able to identify, minimize, and mitigate those impacts with a great deal of success.

That said, there are some key differences bio-technology sector. We are quite concerned about what I would call significant on-going impacts to various parts of our aquatic

resources and their on-going concerns about issues with avian mortality in different parts of our system.

As I kind of go through these next slides, they are going to be very technical and very dense. I am showing them to you in the introduction for a couple of reasons. One is that as I said, I really try to suspend my personal beliefs and rely on the data and the assessments that we use in these reports.

For years the staff in the Air Quality Unit has been saying this really isn't worth digging into further because we know the issues. They are small, they are not consequential, and you guys should dig into some of the other issues that need more work. So, I tended to agree with that assessment, but I learned quite a bit from the data base that Joe Loyer put together this year, so I would like to show you a little bit about what I learned in class in 2005.

Again, these are going to be technical slides. Bear with me, you can study them at your leisure as you go through the report.

The first of these lists out monthly generation GWhs from 2001 to 2003. That is the

time series for the data base this year. Starting from the bottom, you can see generation, four ways to energy, waste to energy, cogen, geothermal, and nuclear. These are all what we call base loaded or high capacity factor operations.

So you can see, not a whole lot of generation for a waste to energy. That is not surprising. It measures about 1,000 MWs. Where I started to learn things this year is that cogeneration, there is about 7,200 MWs of capacity, but you can see it occupies a fair amount of the stack bar here for generation.

One of the other things that is noticeable here in terms of the ratio between capacity and energy are the steam boilers in combined cycle plants. So, we have about 19,000 MWs of steam boilers, and you can see over time their contribution for energy production is diminished where as the combined cycle units, which are the ones that we license now, has been increasing over time. I think that is generally a positive trend. Again, you can see the ratio of at their capacity because that is 27,000 MWs, that is about a third of the total of capacity in California, is actually producing a somewhat

modest amount of electricity.

Some of the other things that this chart shows are obviously the summer peaks, and we have a very wide ratio from peak generation to off peak generation. It is hard to account for that in terms of system reliability.

There is also a lot of information presented in this slide. What we have been doing over the years is tracks the Nox emission rates, so that is on a system average how are Nox emissions in terms of pounds per MWh rising or falling over time.

That was really a question I wanted to get at this year, how is that evolving and also in response to one of the Committee's questions, are there significant differences between the air basins and the resource mix. With those marching orders, we set out to look at this question.

The answer we got surprised me quite a bit. We are making no policy suggestions or options whatsoever based on this information. I think it is very intriguing, and I think we need to study it more and confer with industry and different districts to see what to make of this.

This chart, as I said, shows many

things. The first line is the Nox emission rates, so pounds per MWh. That is a very positive trend. Three years is not a long time, but we've seen almost a 20 percent drop from about .5 pounds per MWh to .35, that is good news.

These bars here show total Nox emissions per technology type, and down here, you can see that the combination of waste to energy and cogeneration, so again, that total is a little over 8,000 MWs are producing from on this side it was one half to this side towards 2002/2003 about two-thirds of the total Nox for our state's power generation system. Again, that just caught me by surprise. We looked at the initial results is the data right, we don't know. We are confident to a degree that the data are accurate. Again, I don't know what to make of this, but it is quite suggestive, and it tells to me that what we always assumed about environmental impacts from power generation may or may not be true, and it is good to have an open mind as we go through these types of analyses.

The third technical slide in the series I wanted to show you also had some very surprising results. So, this shows capacity factors, and

that is, at what percentage does a given plant operate in a year, so there are 8,780 hours in a year, and these are the percentages by which they run.

So, nuclear no surprise. Pretty much has 100 percent except when you need to refuel. The purple line here is called "must take", so that is waste to energy, bio mass, geothermal. Technology again operate in a base load characteristic. That is about 60 percent capacity factor.

The blue line is called intermittent or seasonal resources, that is large hydro and wind. So, ones that are dependent on weather cycles to produce electricity. You see that ranges from 20 to 40 percent, not a real surprise there. You can see how they peak. This is mostly due to when hydro is at full capacity or production which is during the spill period in April/May/June.

What surprised us quite a bit is what we are calling dispatchable resources. These are the steam boilers and the large combined cycle units. They really are not using much of their capacity. Again, you think about this is about 27,000 MW total capacity where as up here we are talking

about 8,000 MWs. I'm just going what do we make of this. Again, I don't want to overstate it, but I don't want to understate it either. So, I think it is good food for thought for future assessments.

The main story that we wanted to tell this year is again that we think there is real success in terms of air emissions on the power sector, but there are four areas where we have quite strong concerns that we want to bring to the public's attention. So, this one, again, is a success story, power sector air emissions.

As we all know, air quality in California is very very bad. Most of the big air districts are not attainment for various criteria pollutants, but power sector air emissions are no longer a principle driver for air quality planning in most of the air districts in this state.

As I've hinted before from our perspective at the staff level, we really don't think that this is a key issue of concern. It doesn't mean do anything differently. It is a success story because of the rigor with which the ARB, the air districts and our own staff, look at these plants as they come in for permitting and



repowering.

Just some of the facts to back this up so you can see Nox is about one percent of total Nox for this state. Co2 is about nine percent. PM I think ranges from one to two percent.

I've talked about the regulatory program. The new combined cycles are just very very environmentally efficient machines, and as they come in, those are really driving the Nox rates down even further.

For the first time, we took a look kind of a systematic look at potential for toxic risk to public health. Mr. Mike Ringer did that, and he found very very small risks to public health from that. Somewhat of a different story for inhalants and particulate matter, but for toxics, this is the story.

As I've said, within technologies, there can be some quite important differences. One of the things that I didn't mention from this previous slides that in terms of dispatch, so again, this is the cleaner part of the fleet. This is where most of the capacity is. Most of the steam boilers have been retrofitted with SCR and other Nox controls. The combined cycles are

very very clean, but in terms of dispatch, they are really being used in a load following mode as opposed as base line mode. So, that surprised us.

The other big thing that I learned this year is to think of sea water as habitat and not just as the cheapest and least valuable of the water commodities available to us in California to cool our power plants.

As I said, impacts to aquatic resources, really one of the main themes that we are talking about this year and that includes impacts to the near shore marine environment from ones to cooling power plants and impacts to the inland rivers and streams from hydro power production.

Just some basic factors here, Rick York and his team will talk about this in much more detail tomorrow morning, but we have 21 power plants totally 23,000 MWs. Again, that is a little over a third of our fleet that uses this cooling technology.

In the assessments that we've done, we know enough to know that the potential for wide spread effect and the potential for it to be significant is also there. It seems to be understudied and somewhat under appreciated issue,

although that is changing as we speak.

The work that we are doing, the more that we learn about this is coinciding with work by other agencies. Some of the major things going on are the administration's new Ocean Protection Council. There have been several major reports at the federal level. The U.S. Commission on Oceans and the PU Ocean Commission and the Environmental Protection Agency has issued a major rule change to Clean Water Act 316b which regulates attainment through once-through cooling facilities.

The report that we will be presenting tomorrow morning compiles pretty much everything we know about this and has a series of policy options too.

For hydro power this year, we have not done a lot of major work. We did a big paper two years ago. That said, the findings and impacts that we identified two years ago still hold. Basically, that hydro perpetuates significant ongoing undermitigated impacts to rivers and streams throughout California.

One of the comments that we got from industry last years is that may be true generally, but how do you know it is true specifically. I

think that is quite a fair comment. With that, part of our data request was to start compiling infrastructure and hydrology data upon which we will start doing environmental assessments over the next several years. For now, I have to leave it at a general level and say that this is generally true.

One of the clearest metrics that we can use is that only one fourth of the FERC licensed hydro powered projects in California meet current state water quality standards as enumerated by the State Water Resources Control Board. That is just a fact.

There is a relicensing boom through FERC in California. About one-third of the fleet will be licensed between now and 2015. That provides just major once in a lifetime opportunities to really get these things up to current environmental standards.

Staff from our office and others are providing a lot of support at different state agencies working on river systems like the Klamath and some others.

Avian mortality is another subject. Again, we are presenting a paper on that tomorrow.

Wind is really kind of the best and most flexible and most commercially viable of the renewable technologies available to meet our ambitious renewable standard goals. With that, we are concerned about the on-going rates of mortality to raptors or hawks, eagles, and other types of birds.

The issue at Altamont is severe enough that there has been a moratorium on expansion for several years. Solano County is another emerging wind resource area that also seems to have very high rates of bird use. So, the potential for mortality and problems is there as well.

Through our Public Interest Energy Research Program, we are doing all that we can through our agency to understand, identify, minimize, and mitigate these problems. It is no one's interest to have this go on. To that effect, we will have a major paper representing tomorrow afternoon.

The other thing that we are taking a look at this year is electricity imports. In any given year, about a third of it comes from out of state. Nine percent of that comes from power plants that are owned and operated either fully or

partially by California utilities. There is an important accounting convention to keep in mind here for environmental purposes, we state everything generating outside of California regardless of who owns it. That is an import.

When we do electricity assessments for supply/demand balance purposes, as Ron Wetherall will do shortly, he uses a different number, he says 21, 22, 23 percent is actually imported because we count the other nine percent as part of the California control areas. That is just a convention to keep in mind.

Coal is a major part of our electricity supply, and of the dedicated facilities, about 4,700 MWs are driven by coal. Not surprisingly, emission rates are quite a bit higher for the out of state generation than they are for in-state. Nox is about four times higher.

Coal seems to be becoming the fuel of choice for future power plant development. It has been natural gas over the last five years or so, but we have identified a number of new plants coming or they have been proposed. Again, not surprisingly, water use is not just an issue of concern in California, but also in the Western

U.S.

PRESIDING MEMBER GEESMAN: Do you know of the new coal plants proposed, you've got 27 identified there, are those utility projects or are those merchant projects?

MR. MCKINNEY: That's a good question. We've compiled a table, and I have to go back through that and look at it. We will talk a little bit more about it this afternoon, and I will see if I can answer your question by the this afternoon.

As I close out my part of the discussion this morning, I wrote a series of small essays to help me think about how do we think about environmental impacts and effects for a system this big and diverse and really is non-traditional as ours.

The first thing is that your renewables and qualifying facilities, those are basically good things in terms of power generation, and yet they have a series of impacts all unto themselves, and we are working to understand that and to educate people about that.

As I mentioned before, the emission rates and dispatch levels for renewables and QF's

is quite a bit different than it is for other parts of our fleet. Wind is again really a technology of choice because it doesn't have any emissions, but we've got some problems with birds and raptors.

Again, hydro power is often considered to be a clean energy resource. Even people that I work with on Klamath, which is the second largest salmon river in the state, and the hydro projects there have really done a lot of damage, even the people working to mitigate that and talk about hydro power as a clean energy resource, want to go what part of clean are we talking about here, is it in the air or in the water. You really have to kind of broaden the way you think about that.

One thing that we have learned painfully here and that agencies working with FERC are learning painfully on their own is that old infrastructure is very expensive to upgrade and bring into conformity with current science and law. To that effect, it seems to me that some of our regulatory systems are not really keeping pace with the evolution of scientific understanding that we have for these impacts to aquatic eco systems. So, our agencies and our commissioners



have wrestled with the repowering applications with coastal power plants over the last few years.

Those applications come in with state of the art emission controls for the air part, but continue to rely on 1950's air technology for cooling. I call that clean hands, dirty feet. Again, this is something we are really not used to thinking about, but as concerns over our coastal resources and eco systems in the ocean environment continue, that is something that will need more attention.

The foundation for California's energy infrastructure is really based on hydro power. A lot of the system, especially that the IOU's own and operate, date from the turn of the last century, so more than 100 years old now. FERC licenses also can be very long lived. With that means that when those facilities were built, when those initial licenses were issued say 50 years ago, our understanding of science and aquatic eco system impacts was substantially different than it is now. Again, it is hard to make changes when you've got the steel and the concrete there in place.

What we are finding in my view, is some

of the coastal plants, but especially with the hydro plants, and in some instances decommissioning them or relocating may be the cost effective or efficient way to go, both from an economic and societal point of view.

A couple of other parts of our energy infrastructure that are considered to be benign, wind, I've already talked about that, but electrical transmission lines, nobody says that they are pretty, but nobody thinks of them as causing any level of environmental impact.

The data really don't support that, so in my view, we would need to do more research and more work to really understand now how do these two parts of the infrastructure, which are slated to expand quite substantially over the next decades, how do those impact social communities and environmental communities.

The cost and benefits of power imports is another one, we wrangle a lot over that internally. I think the fair way to say it is it a regional win/win. You've got surplus resources in other parts of the Western United States. You import them into California, you don't get the environmental impacts, you get the benefits of a

diverse fuel mix, or are we exporting our pollution. I have my own thoughts, but I don't have the answer, and that is something we will be wrestling with and trying to understand better over time.

As concerns over climate change in our drive to really understand how Co2 emissions are generated, how can we mitigate and minimize those I think is question about is electricity will become more important.

Lastly, we do a lot of work on climate change. We are really trying to understand and identify Co2 and Co2 equivalent to emissions, reduce those. There is just a tremendous amount of work going on in the political arena and in the research arena.

A lot of work is being done through agencies on water supply, on ag operations and those types of things. Personally, I am not seeing a lot of research being done on the environmental effects climate change. So, two that I have highlighted here for your consideration when we site a power plant and if we impact natural resources or wildlife habitat, that has to be compensated for.

The way we do that now was we buy land or have the developer buy land at a habitat mitigation bank. Those banks have fixed boundaries, and they can become surrounded by the development. As the climate shifts, the vegetation patterns will shift and where is that vegetation type going to go and where are the species that are going to depend on that vegetation going to go. I think that is an issue we need to start thinking about.

Then lastly for inland rivers and streams, again, I see a lot of research being done on effects on hydrology. We presented a paper on effects on hydro power production. I don't see a lot of research on potential effects to aquatic eco systems for inland waters.

I was talking to folks at the forest service about that because they have tremendous laboratory and research capacity, they said they don't do climate change these days. So, it may fall to the state.

That concludes my presentation, so as I turn it over to other members of our staff, I just want to again kind of run through the agenda. So, for today, we have the Environmental Performance

Report, and then this afternoon, Out of State Power Issues. Tomorrow morning, Once-Through Cooling. Tomorrow afternoon, Avian Mortality.

For each of the agenda items, as I said, I and others of our team will make presentations. and then ask for any comments from government or other stakeholders. As you've noted, the Commissioner ask clarifying questions. As you come up and speak, whether you are a presenter or a commentor, please be sure to use the microphone and state your name for the record. This is being recorded and transcribed.

We would like to have written comments through mid July. In terms of agenda, we will just kind of keep moving through here as we finish the agenda items.

Are there are any more questions from the Commissioners or advisors before we move on to the next part?

COMMISSIONER BOYD: Jim, I don't know whether it is a comment or a question, but there has been a little bit of a reoccurring theme that has occurred in my mind and throughout the presentation this morning. I frankly didn't know at what point and maybe this isn't even the point

to broach it or wait for the rest of the report, but your mild surprise about the dispatchability issue, the comment about the slow pace at maybe repowering or what have you. One of the things if my memory serves me right, which it doesn't always anymore, in another staff report on aging power plant issues, one of the mild surprises to a lot of us was the fact that old steam plants are really good or better at load following than the new modern combined cycle plants that they don't turn around all that fast. That may have something to do with the dispatchability of plants and this that and the other.

The assumption on a lot of people's part was all old plants have got to go for environmental purposes, they are not efficient and this, that, and the other. The surprise to us was well, they are kind of critical in weak spots in the system because they can turn around pretty quick, and they do load follow. So, I just toss that out as one of the compounding factors or issues that may effect a couple of the issues that you brought up and maybe we can get more comment on that throughout the course of this couple of days.

MR. MCKINNEY: I remember back to when AB1819 was passed and really one of the big environmental reasons was to free up investment resources and new technology is because those dirty old dogs were just polluting our air up and down the state.

COMMISSIONER BOYD: A lot of the myths of AB 1819 were not realized. It is almost not fair to bring it up anymore.

PRESIDING MEMBER GEESMAN: I think that it is important to recognize that no combined cycle plant is built or invested in with the expectation that it is only going to operate 20 percent of the time. The earlier comparisons between the new combined cycles and the old plants, I think for the most part were done on the assumption that both were operating about 70 percent of the time. I would also raise the question as to how long term an equilibrium, those 20 percent capacity factors are likely to represent. I'm not certain that you are going to see many or any new combined cycles brought in to the market.

If power purchase agreements aren't available to provide a substantially greater

operating assumption than 20 percent, I would also think that many of those older steam plants are unlikely to continue operation unless they have the artificial crutch of RMR contracts or some similar device because at 20 percent operating factor, nobody is making any money. I think your snapshot captures where we've been the last several years. I'm not certain it provides a particularly good projection of where we are likely to be five years from now.

MR. MCKINNEY: Personally I hope that is the case, and when you use the term snapshot, and traditionally the way we have looked at this stuff has been almost on a snap shot basis. I think as you dig in deeper and really try to understand environmental performance issues, you have to start thinking about dispatch and capacity factors, and really how is the market and the ISO driving dispatch considerations. So, this is one of our initial forays into that part of the business. Again, our colleagues in the electricity offices are just across the hall, so we are working wt them more than we have in the past on these issues.

With that, let me introduce our next



speaker. With that, I would like to introduce Ron Wetherall with our Electricity Analysis Office, and he is the author of what we call the System Overview part of the EPR.

MR. WETHERALL: Good morning. My name is Ron Wetherall, and I work in the Electricity Analysis Offices as an Electricity Specialist.

I want to talk a little bit about an overview of the electricity system today just to give you a brief overview. We have a system operator that controls the dispatch of the resources. It is a very important component. Generation, we have a variety of different technologies used in California of various sizes from small roof top PV systems to large centralized stations.

Through the use of our transmission grid, we are able to get power located throughout the Western U.S. as well as Canada and parts of Mexico. We have a generation system that we are hooked up to as I mentioned the Western United States allows us to buy and sell power to different parts of the grid. The distribution system is basically designed to step down the transmission voltage to a useable level for retail

use.

California has various sources of generation. As you can see merchant generators, QF's, Muni's, regulated utilities, federal and government projects, and imports which are an important part, and self generation which is largely the petroleum industry and used to sell their surplus power.

Here again is an outline of the different fuel technologies that are in play in California. As Jim mentioned, we have quite a variety of different thermal and renewable generation. As you can see, natural gas is the predominant fuel in California at this time. Most of the newer power plants are running on natural gas due to its clean air emissions as well as its dispatched characteristics.

Of course the other ones, hydroelectric, coal, and nuclear will remain an intricate part of our system. Renewable generation, as you can see at the bottom there, these are because of our renewable portfolio standard which has been implemented, we will see a growth in the renewable capacity over the next ten years.

California has a diverse mix of

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generation as I mentioned before. There is 61,000 MWs of in-state nameplate capacity. Since 2001, we've added almost 13,000 MWs of nameplate capacity, including 225 MWs of wind since 2003.

California has about 6,200 MWs of dedicated capacity located outside of California. Shares of Palo Verde, Hoover, Four Corners, other things located within California control areas.

Here is a pie chart showing if you look at the upper corner in yellow, you see the 22 percent imports. That is imports located outside of this state. If you look down at the lower right, you see coal owned by in-state utilities. Those two together add up to about the 32 percent figure that Jim was mentioning. About a third of our annual energy use, we rely on imports from out of state.

As you can see in the lower corner, natural gas is 34 percent, it is the largest single use. That includes cogeneration, and then hydroelectric and nuclear make up another of the lion's share. Then we have 12 or 13 percent of renewable technologies are very important and growing.

Here is a slide that shows how we've

added generation. This is kind of like you could look at it as a born on date for each of these technologies. In the 1920's, during this era, we had hydro in blue. We also had some oil plants and stuff that were since removed because they are so old. As you can see, we continue to add the oil and gas units in red here throughout the decade. By the time we got to the 70's, most of the oil units were converted over to natural gas.

Nuclear is still an important part of the mix. Base loaded resources which was mentioned before. Geo thermal and waste to energy, these were all brought on line during the 80's and 90's as part of the qualified facilities program. It was an outgrowth of (indiscernible). PURPA, the Public Utilities Regulatory Policy Act.

As of the last ten years, the last fifteen years or so, most of the new generation that has been proposed and built has been combined cycle because of its efficiency and its air quality. It is a relatively clean technology.

As I mentioned before, we are quite reliant on energy imports to meet our annual demand as well as a peak demand. Significant amounts of surplus capacity are available on the

west, but there are some concerns about this summer that we are not going to be able to move electricity where it is needed during the peak times because of congestion on the ISO grid south of Path 15. This would affect mostly Southern California.

The Pacific Northwest, one of the advantages of being part of a grid is that we can share our resources with our neighbors. For instance, the Pacific Northwest experiences peak demand during the winter months while California and the Southwest has their peak in the summer. So, we need not build out our systems to meet our own demands. We can share the surplus resources of our neighbors. We can both benefit from seasonal exchanges of capacity.

Here is a map that basically shows largely hydro as well as some natural gas coming from the Northwest there, and we have coal as well as some nuclear and natural gas coming from the Southwest. California also produces its own resources, but like I mentioned before, we are reliant on imports.

Here is just a map showing the WECC Western Electricity Coordinating Council, these

are all the members of the western grid I was mentioning before of which California is a part.

There is a significant difference between the peak summer time demand and the average demand. In once sense, you can say California doesn't really have an electricity generation problem per say, we have a peaking problem in that the peaks in the summertime are so much larger than our average demand that thousands of MWs of capacity stay unused a good portion of the year except for maybe a 50 to 100 hours of peak demand. That was one of the concerns with the aging power plant study is a lot of these plants weren't given an opportunity to run very many hours of the year and there was a concern that may retire or go away because they weren't able to recoup their fixed costs.

As it turns out, growth in Southern California this last year was a little stronger than we anticipated and several of these power plants that had been moth balled have been brought back into service and given contracts by the IOU's.

PRESIDING MEMBER GEESMAN: Is our peak demand problem becoming worse over time, are load

factors getting worse?

MR. WETHERALL: That's an interesting question. I would have to actually look at the data. On a topical level, it appears as though, yes, the peaking problem is a major part. We've been building a lot of combustion turbines, especially during the energy crisis, there was a big push to build CT's and later try to combine them into combined cycle plants.

There are other alternatives to building combustion turbines to meet demand, notably technologies which shift the demand off of peak periods and into non-peak periods. It is things like time-of-use meters and interruptible rates, thermal energy storage, air conditioning with recycling. Those types of technologies do offer promise, not necessarily that we build our way out of the problem, but it seems to be the prudent thing to do is a combination of adding some peak capacity as well as working on some of these demand side management type programs.

PRESIDING MEMBER GEESMAN: We must have historical load factors, though, don't we available to us?

MR. WETHERALL: Yes, we do.



PRESIDING MEMBER GEESMAN: I wonder if you could for some future workshop gather load factors, both on a statewide basis and for Northern California and Southern California over the last 25 or 30 years, give us a picture as to what that trend looks like. I recognize you would probably have to involve the demand office as well, but I think it would be something that might illuminate our report quite well.

MR. WETHERALL: Very well. I will look into that and get back to you. I just wanted to point out this particular slide. We talked about average demand. Average demand is going to be somewhere in this area in the course of the year. As you can see, the peak demands are very spikey. The low points tend to be weekends and holidays.

As you can see, there is quite a bit of variability. In essence, there is one possible explanation as to why the load following plants are not utilized, have as high capacity factors as we might expect. They tend to be generating when prices are higher as well, where as the base loaded plants are there all the time. The load following plants are able to reap some of the higher prices as well. That helps to keep them

viable.

Here is a slide that shows the typical hot summer work day. In the very beginning here you can see this is the middle of the night. It kind of dips, our overall capacity dips, you know, 5:00 am to 7:00 am., and then the nuclear kind of runs all out. The must take renewables and QF's, the same way. Imports don't vary a whole lot. They might go up a little bit on a really hot day, but the real load following is the hydro and of course the gas and coal units.

Up at the top here, here is the peaking resources, and again, as I mentioned, they can be met by combustion turbines or they can be met by interruptibles or other demand-side programs that shift the demand away from those peak hours.

PRESIDING MEMBER GEESMAN: You are suggesting that on that typical summer day we are ramping up the out-of-state coal plants?

MR. WETHERALL: No, I'm sorry, the coal plants should be --

PRESIDING MEMBER GEESMAN: Don't they operate in base load?

MR. WETHERALL: Yes, they do operate in base load.

PRESIDING MEMBER GEESMAN: How do they ramp up like that?

MR. WETHERALL: They shouldn't ramp up. Unfortunately, this slide including coal, but it should be just natural gas. The coal plants are operated as base loaded plants. They are not load following.

As I mentioned before, there are viable alternatives to meeting peak demand, mechanisms that shift demand away from peak periods and time-of-use rates, thermal energy storage. One of the very surprisingly successful programs we had back in 2001 was the Flex-Your-Power Program, where we had a media-driven campaign to get people to turn off their dishwashers and washing machines and other unnecessary things during the peak demand.

We had very good success. I think it was somewhere between 15 and 20 percent load reduction, far exceeded what we had anticipated. Those types of things can be useful in a tough situation like we were in. I think it was helpful that we had some blackouts to really catch the public's attention, as bad as blackouts were, they did seem to get people's attention, and we did have good results with the Flex Your Power

Program.

Transmission as I mentioned before could become a concern. This summer in Southern California, the area south of Path 15, they may have difficulties delivering electricity where it is needed. The ISO is working on this problem, and they are working on some simple little transmission upgrades to address the problems, and as I mentioned before, they hired back some of those plants that were in mothball, the coastal plants.

During peak demands on a hot day, California may experience some resource constraints. We are talking a one in ten type of a day, one in two.

One of the final points that I'd like to make is the Energy Action Plan, which is the state's plan to guide resource procurement, it is a cooperative plan developed by the Public Utilities Commission, the California Energy Commission, and the California Power Authority. They developed standards as to reserve requirements. I think it was at 15 to 17 percent reserve requirement. They also developed what is called a loading order. It is a preferred loading

order of resources.

As a partner in developing the California's Energy Action Plan, the PUC will follow the Energy Action Plan's preferred loading order as well as incorporating the renewable portfolio standard in proving the resource plants that are being submitted by the IOU's. As a matter of fact, that process is on going, and here is the loading order that the EAP has designated.

First of all, the idea is to deploy all cost effective energy efficiency measures. If you don't need to build a power plant because you were able to diminish load by shifting it off of peak or building in energy efficiency into your building designs and appliance designs, you don't need to build that power plant, that is the cheapest way of getting that resource and meeting that need.

After deploying all cost effective energy efficiency measures, the next step would be to promote renewable generation and distributed generation. The idea is to try to put generation closer to load and rely less on transmission and large centralized stations, which have their own set of issues and problems.

Implicit in the plan is the realization that it is going to take a while for renewables and distributed generation to get up to scale. In that time, the Energy Action Plan recognizes the need to continue to build some large centralized facilities. The PUC has indicated that it has a preference of repowering existing facilities. There have already been quite a few facilities that they have been able to do that with.

The fourth tier of this plan is to improve the bulk transmission grid and distribution infrastructure. This is something that has kind of been working at from both ends. You've got the owners of the transmission system, the IOU's, the Muni's, and all the different players, and because of the area that transmission covers and the issues of all the different jurisdictions of government and stuff, it is proving to be a little slower and taking a little more time than people might have liked, but we are making progress there as well.

PRESIDING MEMBER GEESMAN: You know, I just have to differ with you. I mean it has been four years since the lights went out, and the fact that we are concerned about the prospect of that

experience repeating itself in Southern California this summer suggests to me that we have not made adequate progress. Certainly I think in the area of bulk transmission planning or expansion, we've made shamefully poor progress. So, I recognize that it may be comforting to feel that everybody is working hard, but for the life of me I can't look at the situation that we currently face and feel that progress has been anywhere close to adequate.

MR. WETHERALL: Point noted.

COMMISSIONER BOYD: He is not alone either.

MR. WETHERALL: We recognize it as a problem. We recognize it as a problem, especially like you mentioned if we are facing shortages again. It is possible if we had a mild summer, that none of this would happen. The fact that it is being considered is a good point that it is something that does need to be addressed.

Just real quickly, just to summarize the findings, California's resource mix is diverse and expanding. The fleet of power plants overall is getting cleaner by adding more combined cycle plants. Our emissions are going down per unit of

output. Imports continue to play a large role in California's electricity system.

Peak demand and average demand are different, and until we get some source of time-of-use meters or other institutional infrastructure in to address this, I think there will continue to be a large difference between the two. It is largely driven by air conditioning demand. As development in the central valley and especially in Southern California, we are building more houses in the desert, your air conditioning load is growing more quickly. That is what puts a lot of pressure on the peak demand. That is what driving the peak demand. This is still an industry that we are aware of. There are people working to try to develop these load shifting technologies such as time-of-use meters and air conditioning cycling and that sort of things.

There are viable alternatives to meet the peak demand as I mentioned, thermal energy storage, time-of-use meters, etc. The final point I would like to make is that the Energy Action Plan is guiding procurement. If we do have problems this summer, it will not be anything like 2001 in that the IOU's are now procuring resources



for their own needs plus 15 percent reserve margins. We don't have all of our eggs in the day ahead market and the PX, utilities are allowed to sign long-term contracts which allows for some hedging of costs.

Although we may have some tight days, some emergency days called by the ISO this summer, I do not anticipate anything like what we experienced in 2001. If there are any questions, I would be happy to answer them.

COMMISSIONER BOYD: I'm straining not to make a comment here. I have no question, and it falls to staff for the presentation they make and the good politics involved between inter agency cooperation, but as Commissioner Geesman indicated that some of us, with different points of view on what's wrong, still feel that all is not well in River City so to speak. To me, we are moving with glacial alacrity in the area of long-term contracts. How can you expect to induce economic investment. Why do we have 8,000 MWs of approved power plants and not funded, etc.

The hybrid system that was not designed that occurred through default turned out to be not a bad approach, but then you know, one utility got

to have a power plant, so three big utilities got to have a power plant for equity. Now we are having the big debate over transparency in the system and the suits against us on what is confidential and what isn't.

All that keeps so much more under the shroud. It just seems to me to set up more of a return to the old days than I think a lot of us hoped we were headed for. I mean, if we don't have transparency and knowledge, at the very last second, what else can happen but private utilities or IOU's build more power plants. The procurement process is an extremely positive thing, and it has accomplished, and the Energy Action Plan has accomplished unknown cooperation between two major agencies who need to cooperate and things are looking good, but there is a lot to be done.

PRESIDING MEMBER GEESMAN: I am fearful that we are entering a stage of massive self-deception on this stuff. I think our analytic techniques are not particularly well suited to addressing the scope of the problems that we face, as was pointed at the Energy Action Plan session here last week or the week before. Our 15 to 17 percent planning reserve margin fails to provide

adequate reserves in what our staff is calling a one in ten scenario in Southern California.

If that is the case, if the conventional rules of thumb that we've been following don't produce adequate security of reserves, then I wonder why we haven't developed new or better analytic techniques to better design the electricity system that we have.

I think that what you will see over time is that our principle failure has been inadequate investment in the transmission system, that our inability to move power from where it is generated to where it is utilized has failed to catch up with the needs of a growing economy or a growing population. I am not the analyst here, I simply react to the material that is presented to us.

One other point that I do want to raise, you indicated that we've made a fair amount of progress on repowerings, and I am aware that we've permitted a couple of repowerings. I'm not aware off the top of my head, other than the City of Los Angeles, which has repowered a couple of plants on its own without benefit of our permitting process, I am not aware of any repowerings that we have permitted that have actually been built.

MR. WETHERALL: Moss Landing --

PRESIDING MEMBER GEESMAN: That's one?

You are right, and the one down in Burbank.

MR. WETHERALL: Huntington Beach.

PRESIDING MEMBER GEESMAN: Magnolia and Huntington Beach. Okay.

MR. WETHERALL: Another factor that I've heard from the energy service providers is that there is a lot of regulatory uncertainty, especially when things like core on core are discussed, exit fees, it really makes it difficulty for the IOU's to try to determine how much resources do we have to actually figure on. Are we going to lose some of these corn or core. Are they going to come back, are they going to stay. There is a lot of uncertainty I think that is kind of holding back investment that might otherwise occur.

PRESIDING MEMBER GEESMAN: I have to interrupt you there. I think the Public Utilities Commission in their December 2004 Procurement Decision made emphatically clear that they are not going to allow the investor-owned utilities to bear the burden of departing load. That there will not be cost shifting, that there will be exit

fees. I certainly agree that there is a continuing drum beat about the pernicious effect of uncertainty, but life is uncertain.

If you are going to be an operator in the economy, you have to confront uncertainty. Utilities, given the regulated nature of their business, face a lot less uncertainty than any other business in this state. It bothers me to hear you repeat that refrain when I think the CPUC has taken extra steps to provide assurance that the utilities and their businesses will be taken care of.

MR. WETHERALL: Okay, anyone else have any other questions?

(No response.)

COMMISSIONER BOYD: Thanks, Ron, for being the foil for a lot of this discussion.

MR. MCKINNEY: Our next speaker is going to be Mr. Mike Ringer, who is the Supervisor of our Air Quality Unit.

MR. RINGER: Good morning. The principle author of section, I would like to acknowledge as Matt Layton, he can't be here today, and also Joe Loyer of my staff to the extensive data base analysis. So, I would like to

thank him through this.

I'd like to start off with a summary of the findings to highlight some of the things that we would like to talk about a little bit later on. As was noted before, the generation fleet in California is very clean, and that is due to a number of different factors, not the least of which is the nuclear and hydro capacity that we have, the extensive use of natural gas, and the fact that over the past several years, the different air districts have been cleaning up and requiring retrofit emission controls on a lot of the generation.

The emissions are low, and we don't consider them to be a principle driver of air quality in most of the districts. That is not to say that in some of the districts at some times of the year, certain parts of the generation fleet don't add into some of the problems that the districts have, and that is not to say also that the districts are not continuing to look at additional controls that may be cost effective, but they may consider requiring in the future.

We are going to see and it has already been discussed to some extent, that air emissions

are not factors in plant dispatch. We will see that the dirtiest parts of the fleet are not necessarily being displaced, and that some of the cleaner portions of the fleet are indeed load following and are certainly not up there when it comes to dispatch as far as being first.

As I mentioned, Joe Loyer did a lot of the data analysis on this. There is quite a bit of data out there. We used quarterly fuel and energy report data on a unit specific basis for about 1,000 facilities in the state representing 61,000 MWs of capacity. There is still some disparity in the data, however, we feel that the data does allow us to look at these generation and emission on a comparative basis, and that it is pretty useful. We have looked at generation technology and fuel type data over 36 months.

We concentrated on three air districts in the state: South Coast, Bay Area, and San Joaquin Valley. The reason we did that, they contain the bulk of the state's population at about 76 percent, and they contain much of the state's total NOx of nitrogen emission and reactive organic gas emissions.

They do only generate about one third to

one half of the electricity, however, there is a disproportionate share of in-state generation emissions in these districts. A lot of the clean capacity, such as nuclear and hydro, is not located in these districts, and they do have a lot of the older facilities that have been built there. Although they have been cleaned up, they have a disproportionate share of emissions compared to their generating capacity.

This slide shows the small portion as a percentage for both the three districts I mentioned as far as statewide, but oxides of nitrogen and particulate matter are very low percentage of total emissions. This slide only shows particulate matter less than ten microns.

In the report itself, we also discuss PM 2.5 which is a smaller subset. Particulate matter, as you know, over the past several years has come to the forefront as a health impact. There has been many many different epidemiological studies that have come up and there's been new air standards for PM 2.5.

In general, oxides of nitrogen are between one and two percent of the total from the electric utility and cogen sector from each of the



three districts as well as statewide. Particulate matter tends to be somewhat less in these three districts, even in smaller percentage. Again, that is not to say that it is not important. The districts, as part of their attainment plans, could still continue to look at the electric utility sector as far as future reductions if they identify plants that could be retrofit, and if they are cost effective.

PRESIDING MEMBER GEESMAN: Where do your projections come from?

MR. RINGER: The Air Resources Board, this is ARB data.

PRESIDING MEMBER GEESMAN: So, you see on oxides of nitrogen the relative contribution from electric utilities doubling between 2005 and 2020. I guess you are concluded that is not a big deal because it comes from such a small base.

MR. RINGER: One of the reasons that it is doubling is because the other parts of the generation -- well, the other parts of the emissions inventory are being reduced. This has been reduced a great deal already. We see the increased generation as well as the reductions from other sectors as contributing to the relative

increase in this.

COMMISSIONER BOYD: You are saying it is not a doubling of emissions, it is a greater percentage of the whole.

MR. RINGER: Right, although there will be some increase in emissions, as generation increases as well.

MS. JONES: If you look at the Bay Area and the nitrous oxides in the PM 10, you notice a big jump between '95 and 2000. Do you have any idea of what is behind that jump?

MR. RINGER: I believe a large portion of that is due to the fact that they think they are going to increase generation. The Bay Area is already retrofit quite a bit. In fact, the Bay Area and the South Coast together have retrofit and reduced emissions from these two sectors quite a bit.

MS. JONES: The retrofit account for the increase between '95 and 2000, it is that jump that I am interested in.

PRESIDING MEMBER GEESMAN: The historical jump.

MR. RINGER: I think that is probably due to the amount of generation. There are a lot

of new combined cycles that came on, but that wouldn't account for that. I can try to look into that in a little bit more detail.

MS. JONES: Thank you.

MR. RINGER: Going to our first slide, this is a statewide monthly generation, and Jim talked about this a little bit. You can see what we've done here is we've tried to put these on more or less in order of how they are dispatched, so waste to energy and cogen are pretty much base loaded. Waste to energy is a fairly small portion, cogeneration is as discussed previously is a fairly large portion compared to its installed capacity.

What is interesting in this, if you look across on the different months and the different years, the cogen sector, a lot of the sectors tend to stay about the same height, so the bars representing emissions sort of stay constant pretty much. You can see geothermal is more or less constant. Nuclear is fairly constant.

What you do see, and up at the top, those generations intermittent tend to be somewhat constant as well. What you see here is an increase in combined cycle over the years starting

at about the middle of 2001, it starts growing, and it gets excessively larger 2002/2003. As that is happening, you can see that the steam boiler section or segment is getting that much smaller. So, we can see where the combined cycle is taking over at the expense of the steam boilers as far as the monthly generation goes.

Looking at this in a little bit more detail as far as capacity factors go, and this slide also touched upon a little bit earlier, the top line will be nuclear which is of course base loaded, and anything that you see less than 100 percent is outages for maintenance or refueling or what have you.

The second line down, the pink line, is called other must-take, which is waste to energy, geothermal bio mass, and cogen. You can see the capacity factor there is fairly significant.

The third line down, the blue line, the brighter blue line, is dispatchable. That is intermittent and seasonal. So, the third line down is intermittent seasonal, which is the hydro, wind, and solar. Now those three together are pretty much must-take, a combination of must-take and base load. That represents quite a bit of the

capacity in the state.

The fourth line down is dispatchable, and that is the combustion turbine combined cycle plants as well as the peakers. I'm sorry, not the peakers, sorry the boilers and the combined cycles are the fourth line down. The last line down is the peakers, which have the lowest capacity factors.

We will see the way these plants are dispatched has no relation to the cleanliness as far as their air emissions. Now, when we talk about NOx emissions on a statewide basis, first you might notice that the righthand scale is off. Each number is repeated. What it should be is that the first number should be .05 and then it goes to .1, .15, .2, .25, etc. I think there was some rounding problem here in the creation here of this graph.

You can see here that the waste to energy and the cogen combine for a large fraction of the NOx emissions. They are not nearly as much of the capacity -- their capacity is not nearly as great as what their emissions indicate. Also you can see here that the combined cycles do increase a little bit over time as more of them come on,

and the boilers tend to decrease as they are utilized less.

The line that goes across the top is going to be the average emission rate over time. You can see that drops due to the fact that retrofit were being required in the districts as well as the combined cycles coming on which are very clean.

PRESIDING MEMBER GEESMAN: On the cogeneration contribution there, by attributing all the emissions to the electric generation, are you basically saying that the steam load is free as it relates to emissions?

MR. RINGER: In the way that we handled the data, that's true, so that does sort of skew this a little bit. However, there would be a small shift towards the benefit of cogen. In other words, it would make cogen look a little bit better. It is very difficult to parcel out exactly what that is. We don't think that the results would be tremendously different than what is shown here on the order of I would say what, five to ten percent, something like that.

PRESIDING MEMBER GEESMAN: Because meeting the steam load through some means other

than cogeneration would only add emissions of five to ten percent?

MR. RINGER: A lot of the cogen facilities are sized mostly to produce electricity and enable them to qualify for the contracts for cogen. I'm not saying they are all like that, but a significant portion of them I believe are that way so that they do generate mostly electricity with some benefit to the steam. So, the gas fired fleet is larger than the cogen fleet. You can see that the cogen emissions here are quite a bit more than that.

Going on to carbon dioxide and green house gas, this is mostly a function of fuel type. Natural gas is fairly low in Co2 equivalent emissions, so that you don't get the big difference between boilers and combined cycle. It is more due to the amount of energy production. There is a slight difference due to efficiency differences, but on this chart, you can see that the top line doesn't really show a great downward trend, although cogeneration does produce a fair amount of Co2, although it is not nearly the difference in this chart if you take steam boilers and combined cycles and add them together and

compare them to cogen, not nearly the difference here as we saw earlier.

The other noteworthy fact on this slide is the waste to energy is very low because of the fact that it is considered to be fairly neutral from the standpoint of carbon dioxide production. If bio mass is burned in a waste energy facility, it is no more than it would have been otherwise if it had been burned say in the field or just left otherwise.

The particulate matter slide here, early on in 2001, you can see a sharp drop off, that is because during the energy crisis, there were a lot of simple cycle peakers that were run, especially in the Bay Area, and a lot of those were liquid fueled, and those have a lot higher particulate matter emissions than natural gas. Natural gas is the bulk of the state's fired fleet. So, particulate matter is more of a function of what type of fuel is burned rather than the technology itself.

Once we went down towards the end of 2002, it just sort of tends to bump up and down according to the contributions of other types -- this is a total emission factor, so this bumps up



and down according to the contribution of other types of generation such as nuclear wind and solar and hydro.

You can see again cogen has a disproportionately large share of the particulate matter emissions as the steam boilers and combined cycles, again, are natural gas fired for the most part, and natural gas is very clean from a particulate matter standpoint.

PRESIDING MEMBER GEESMAN: Isn't most of the cogeneration gas fired?

MR. RINGER: Most of it is on a capacity basis. There is just enough that is not to where it really makes a big difference.

PRESIDING MEMBER GEESMAN: You think that much of the impact of that chart comes from the coal fired cogeneration?

MR. RINGER: Yes. Going to the districts -- I am taking kind of quick look at the districts in particular. The South Coast --

PRESIDING MEMBER GEESMAN: Mike, is there anywhere in your data where you have segregated the coal fired cogeneration from the rest of it?

MR. RINGER: Let me defer to Joe on

that.

MR. LOYER: From my memory, we did divide up some of the coal technology in state from the gas technology in state, but I'm not sure if that actually made it into the final report or not. We did do it in the data base.

PRESIDING MEMBER GEESMAN: It might be helpful if you did provide us with some segregation that would allow us to see the coal fired cogeneration separately from the gas fired.

MR. LOYER: Sure. I gotta' tell you, it is splitting hairs. It is really very low division of solid fuel versus natural gas. Most of the cogen is going to be natural gas. I think one of the reasons for the high PM 10 is we are talking about very old turbines that have a characteristic of a high PM 10 emission rate.

PRESIDING MEMBER GEESMAN: Contrary to what Mike suggested, you don't think it is going to have that big of an impact if you pulled the coal fired out of it?

MR. LOYER: Not for cogen, not really.

PRESIDING MEMBER GEESMAN: That is all I am talking about is the cogen.

MR. LOYER: I wasn't going to say

anything, but --

COMMISSIONER BOYD: I agree with Commissioner Geesman, I think it would be good to have that data in order for us to have a meaningful future discussion of cogen, just so we have it clear what the trend is and where we are going. For a moment there, we indicted it pretty heavily.

MR. LOYER: We didn't mean to truly indict cogen at all. We have sort of to a certain extent mistreated cogen here just because like you quickly identified that we attributed all the emissions to the electricity generation side of it and none to the steam side of it. While that isn't totally correct, it is more indicative of a trend here. I think there are a lot of environmental benefits to cogen that really can't be well displayed here just because of the nature of the format, but we will make sure to make that information available.

COMMISSIONER BOYD: Thank you, Joe.

MR. RINGER: Taking a look at the South Coast, the MWh generation are dominated by steam boilers on the South Coast. The NOx and PM are dominated by cogen again. In the South Coast, the

NOx emission factor or oxides of nitrogen actually improves in the summer months as steam boilers and combined cycles, which are the load followers, tend to come on line, so they have lower emission factors in district generation. So, as they come on line, the emission factor tends to decrease.

The carbon dioxide, again, it is about split between the steam boilers and cogen. In the Bay Area, what is noteworthy there is that several combined cycles came on during 2001 to 2003 time frame, and we could see that actually affected the state wide that I talked about earlier. You can see a lot of cogen and a lot of combined cycle came in to displace boilers.

Now the peakers in early 2001, didn't have that much affect on NOx emissions, but as we saw a couple of slides ago, it did have more of an affect on the particulate matter emissions since some of the peakers are older and liquid fueled. The liquid fuel is much higher in the particulate matter generation than particulate matter emissions than the gas fired.

The generation of oxides of nitrogen is more closely related to cogeneration sector and the steam boilers combined. So, as the steam

boiler generation declines, emissions tend to decline as well. The carbon dioxide emissions were pretty much the same whether you were talking about steam boilers or combined cycles since they are both natural gas fueled.

The San Joaquin Valley does not have any steam boilers currently operating. Their emissions are dominated by the cogen sector. They did have some combustion turbines combined cycles that came on in 2003, but they are more heavily influenced by generation such as wind and hydro which are intermittent, and therefore they have more of an affect on the emission factors over time, raising and lowering them as they come in and go out of the system, so there is more of a seasonal variation in the San Joaquin.

Taking a look at the comparison between boilers and combined cycles for oxides of nitrogen. You can see the top slide is boilers and the bottom side is combined cycle. In both slides, the top line is going to be the emission factor over time. As I mentioned, there has been a lot of retrofit activities for the boilers, and so you can see that is kind of going up and down, but over time it is tending to decrease. There is

a much sharper decrease for combined cycles on the bottom chart.

The combined cycles that were out there that were older do have slightly higher emissions rates, since back to the best available control technology has been gone down over the years, the new combined cycle is coming in are very very clean and tend to drop the averages.

The scales are slightly different on these two charts, so if you look at it, it seems that the boilers are much higher than the combined cycles. If you actually look at the scale on the righthand side which is the emissions rate, you see the boilers are between .2 and .3 where the combined cycles are fairly close to that at about .2 in that last bit of data that we have.

You can also see the blue sector here which is the total generation. You can see that over time the combined cycles increase their generation as we have discussed previously, and the boilers over time are decreasing their generation.

PRESIDING MEMBER GEESMAN: These are state wide averages?

MR. RINGER: Correct. Then we have a

similar chart for carbon dioxide comparing boilers on the top to combined cycle on the bottom. For carbon dioxide emissions, there is no big trend because of the fact that again it is the fuel type that is the big driver here. So, both boilers and combined cycles are natural gas fired. So, to the extent that the lines jump up and down, it is really a matter of when you compare the two technologies, combined cycles are a little bit more efficient than the steam boilers, so that accounts for some.

The slight downward trend in the bottom graph will be because of the new combined cycles coming on line slightly more efficient than what was out there. Then the boilers tend to jump around a little bit.

PRESIDING MEMBER GEESMAN: Isn't your trend on emission rate for the steam boilers upward?

MR. RINGER: It is upward, but if you notice the scale on the righthand side, it is really not much of a large scale. It is really most of it is between .62 and .7.

PRESIDING MEMBER GEESMAN: Okay.

MR. RINGER: It is a little bit

misleading because of the scale. Really what we are talking about is you know natural gasses is pretty clean for this type from a CO2 view. That is the last slide for air quality if there are any comments or questions.

MR. TOOKER: Chris Tooker from Commission staff. Mike, what would you have to do to revise those tables or those figures and show them comparable so we didn't have to struggle with figuring out how to compare? I mean the numbers seem to be different on the axis, why couldn't we have the same numbers in magnitude so we could look at the --

COMMISSIONER BOYD: He is talking about equivalent scale.

MR. RINGER: Oh yeah, you could do that.

PRESIDING MEMBER GEESMAN: Two pages instead of one I think is the answer. I think he did it that way to fit it all on one page.

MR. RINGER: In the report, I think it has exactly the same slides on two different pages, but we could easily manipulate the scale.

PRESIDING MEMBER GEESMAN: It would be less misleading. Thanks, Mike.

MR. MCKINNEY: Since Mr. Ringer is



already up here and is warmed up and everything, I think we are going to have him do his presentation on public health.

MR. RINGER: This is really the first time we've taken a look at public health from the generation sector in one of these reports. I should briefly state that the previous information on air quality deals with criteria air pollutants, which are those pollutants that have air quality standards, such nitrogen dioxide, sulphur dioxide, things like that.

When we talk about public health here at the Energy Commission, we are talking about the health effects of non-criteria pollutants, which is everything else. In other words, if there is no evident air quality standard associated with a particular substance, that means that there is no particular amount that is safe to breathe as far as standards go, therefore, we have to take a look at what we call risk assessment. So, I will be talking a little bit more about that later.

In general, we found that for power plants in the state, air toxics from normal operation is not a problem, it is not a major contributor to regional public health risk. When

I say normal operation, this doesn't take into account any types of accidents or upset conditions.

Risk assessment which I just mentioned is the way that we take a look at the health impacts of non-criteria pollutants. It is a method whereby each of the toxic compound that comes out of facility is individually looked at and assessed and then added together for both cancer and non-cancer risks to make sure that there are no significant risk to any member of the public.

Again, we find not only are there no regional risks, there are no localized risks from either cancer or non-cancer.

PRESIDING MEMBER GEESMAN: Now how did you do that analysis?

MR. RINGER: The Air Resources Board -- well, each facility is required to do an analysis according to AB 2588, and that requires them to take account of all of their toxic emissions, and if they meet certain criteria, they have to do the risk assessment process and then provide data to the local districts and Air Resources Board. The Air Resources Board has got these available, and we take a look at the different facilities that

have to report. As you will see later, there are many many more facilities in the state than we have data for, but that is because only facilities meeting certain standards have to provide the data.

In other words, if they are over certain thresholds where there may be a problem, then have to go through this process. So, the bulk of electric generators in this state don't even have to go through except for the initial part of the process.

We are going to find and we have found that mobile source emissions dominate regional air quality and public health risks, and I will talk about that a little bit in this slide. What we wanted to do is take a look and see which toxics are the most important risk on a regional basis, so the Air Resources Board, based on data from regional monitoring systems throughout the state, has listed the top toxics from a health standpoint.

At the very top, we find diesel particulate matter, which has been in the news quite a bit recently. We talk about highest risk here, this in just from inhalation. In other

words, the average person in the State of California has got about a 540 in a million chance of contracting cancer just from breathing diesel particulate matter.

As a point of reference, this 540 sounds like a lot and it is, however, the average person's chance of contracting cancer at any time during their lifetime is somewhere around 210,000 in a million. So, while this is a big number, we just like to compare it to the total of 210,000.

If you go down this second column, cancer risk, you can see that diesel particulate matter dominates. The next highest one is 1,3 butadiene, and that is mostly from mobile sources. You see that the risk drops off pretty rapidly, 74, 57, and from there it gets lower pretty quickly. The last one being 2 in a million, therefore, everything else is going to be 2 or much less than 2 in a million as far as all the different toxics that you can think of.

If you go to the righthand three columns, what we've done is we have taken a look at the source of these toxic air contaminants. You can see the first three are dominated by mobile source emissions. Benzene, butadiene, and

of course diesel are all related to the transportation sector. That is not to say that stationary sources are not significant or not important, it is just that they are not a very large part.

Especially when we talk about natural gas, natural gas really doesn't result in very much of emissions of anything except for benzene and a couple -- benzene and formaldehyde to some extent, and a lot of things that are much much further down on this list.

So, this tells us from a regional standpoint, at least, the major actor is going to be transportation, and this is reflected a lot by the California Air Resources Board programs, which are heavily heavily dominated towards reducing diesel particulate matter risk over the next several years.

PRESIDING MEMBER GEESMAN: Does that distinguish between size of particulate matter?

MR. RINGER: Diesel particulate matter does happen to be -- the PM 2.5 and smaller category. The particulate matter we talked about in air quality is particulate matter of all sorts including this. There is a little bit of cross

over between criteria and non-criteria pollutants sometimes, but the smaller the particle, the more dangerous it is to health and diesel particulate matter for a number of different reasons, being ultra fine as well as to its composition is an especially bad actor.

PRESIDING MEMBER GEESMAN: If you can go back to that other chart. What is carbon tetrachloride and where does that come from?

MR. RINGER: I believe the carbon tetrachloride, I think it comes from some manufacturing, probably refineries might be the major source of that. I went into this in some detail in another report, and my memory doesn't serve me well now to know what the exact stationary source it is. As I say, most of these don't come from power plants, and power plants do not emit carbon tetrachloride. What little might be emitted, I have to actually go back and say for the bio mass fuel and solid fuel facilities and anything that is fueled by coke or petroleum or coal, they do have quite a long laundry list of toxic substances, but they tend not to emit them in huge amounts.

With the exception of mercury, which are

the bigger actors, which we will talk about a little later.

PRESIDING MEMBER GEESMAN: What is your column percent of toxic from area wide sources?

MR. RINGER: Area wide sources is an ARB definition, that is basically is everything except stationary and more mobile. It could include larger types of facilities, such as ports and what not that have a whole lot of different emission sources that are very spread out.

COMMISSIONER BOYD: It is an air pollution term of art, not necessarily just ARB you use, but it is as indicated, it is kind of everything from your stadium complex to your shopping center to other large facilities that have a whole host of different kinds of --

MR. RINGER: Right, airports would be an example like that.

Now we look at reactive organic gasses which is a term of art again used by the Air Resources Board. This correlates fairly closely with what we call toxic air contaminates. There is different data bases out there, and the list that I showed you earlier doesn't have nearly as much data over time and by sector as this category

called reactive organic gasses.

This is basically everything that we are interested in, and you can see from 1995 to 2010 there has been a lot of progress made, especially in mobile sources. As we all know, reformulated gas and what not, that's where a large part of the risk has come from, and that is where a large part of the effort has been directed to.

Area wide sources not so much, it tends to be somewhat constant. The stationary source sector does show some decrease as more retro fits have come into play, but the line that you can hardly see at the top of each one that corresponds to the number 10, 10, 11, and 12 is specifically the amount of emissions from the electric utility and cogeneration sector. So, on a tons per day basis, you can see that electric utilities and cogen, and this again goes more towards regional effects than it does anything else, is very very small. It is pretty much closely related to what we were talking before the general air emissions.

MR. TOOKER: Mike, I have a question. You said that the reactive organic gas emissions contain the toxics that we are interested in. Are the toxics that are in your previous table where



you talked about diesel the same toxics that are contained in reactive organic gasses?

MR. RINGER: No, diesel by definition is particulate, and this is gaseous. So, there is --

MR. TOOKER: What are some of the toxics that are of concern?

MR. RINGER: Almost any toxic you can think of with the exception of extremely few number of compounds is in this category. Any gas, any toxic gas that is emitted by a power plant or anybody else would be in here. I don't know --

COMMISSIONER BOYD: Benzene and gasoline for instance.

MR. RINGER: Right.

COMMISSIONER BOYD: Which was toxic enemy number one years ago.

MR. RINGER: I mean formaldehyde, any organic compound, that is basically kind of carbon or hydrogen compound, so ammonia -- actually, I don't know if ammonia is in here. No, ammonia is not in here, but benzene formaldehyde, but this provides a good proxy. In the report itself, I believe I have more of a description of what this sector, both reactive organic gas is comprised.

COMMISSIONER BOYD: In the old days, the stone ages of air quality, you talk about hydro carbons plus NOx, plus sunshine equals ozone, but as the science came through, it is more than just hydro carbons per say, so the term of art becoming Reactive Organic Gasses, so you could classify all the various constituents that went into that same equation.

MR. RINGER: We would expect these trends to be quite similar for the toxics that we are interested in as evidenced by the previous slide which showed very low percentage from electric utilities, from the stationary source sector.

Now the AB 2588 which I mentioned does require facilities that meet certain thresholds in each district to prepare health risk assessments, so you can see that there is a fairly low number of facilities in each of the districts. This lists five districts where there is 1,000 -- pretty much close to 1,000 plants state wide, we have maybe 80 or 90 who are actually required to report because they exceed certain thresholds for reporting, and yet the number of significant risk facilities is zero. So, the cancer risk as shown

in the third column in the Bay Area, there are different thresholds for each of the districts, and basically, I just chose what the highest one was. So, the Bay Area, everything is less than 10, Sacramento everything is less, and these are in chances per million of cancer. So, they are very low.

Just as an example, in our siting process here, staff considers anything less than 10 in a million to be less than significant for the purposes of siting, so everything here in these generation facilities would be termed insignificant if they were to come before us in a siting case. The same would be true --

PRESIDING MEMBER GEESMAN: Your cancer risk column is a reporting threshold?

MR. RINGER: These are the actual numbers, so all of the facilities in the Bay Area are less than ten, and this is strictly applicable only to electric generation facilities. Just for your information, the last facility in the Bay Area of any type to be over ten in a million was Dow Chemical, and it is now less than ten in a million as well. Actually, the Bay Area has no facilities at all that exceed ten in a million.

Then the South Coast does have quite a range, but their highest is only five. As I was going to say, this also applies to the non-cancer. Cancer is considered to be the one that you would want to look at. It is the most sensitive. People who look at these things consider cancer to be the most sensitive because it is considered any exposure to a cancer causing agent does have the potential to cause cancer, and that is not true of non-cancer. So, non-cancer's threshold, cancer's non-threshold, so if we look at this and decide that or come to the conclusion that cancer from this measure that the facility is not going to pose a risk, it is quite likely to be also true from a non-cancer standpoint. That concludes the health portion.

PRESIDING MEMBER GEESMAN: Thanks, Mike.

MR. MCKINNEY: The next part of our Environmental Performance Report will deal with water use and issues, and I would like to introduce Natasha Nelson, who is Supervisor for our Water and Water Quality Unit here at the Commission.

MS. NELSON: Thank you very much, Jim and Commissioners and their advisors today. I co-

authored this section with John Kessler, who has been an important consultant from Aspen Environmental Group. As we all probably know, water is a valuable resource in California. As our population continues to grow, it will become even more valuable.

Where our population was only 34 million, it is now expected to approach half a million by 2020. Currently we do have some ground water supplies, but they are limited. In many areas, they are over drafted. Surface water supplies also essentially fully appropriated to districts and to their uses. We are currently in the process of having to remove ourselves from one million AFY of Colorado River water because while we have been taking 5.4 million AFY, we are now being restricted to our 4.4 million under contract because of the large population growth in other states that are up river of us.

Currently planning shows that even in an average year, we may expect fresh water shortages even in an average year. When you look at a drought year, for example, it might be even worse. State water project deliveries, which many municipalities depend on could be cut by up to 20

percent. This competition for fresh water is increasing and leading to reliance on other sources that are lesser quality. These include desalinized sea water and displacing agricultural uses so that water can run down the river or the canal to be used by municipalities.

The availability of water we have seen here at the Energy Commission can be a major constraint, and fresh water conservation is an Energy Commission goal and a state wide goal.

Just as some background on water use, we give an example of a 500 MW combined cycle combustion turbine power plant, which we typically see here during our siting cases. There are two types of water use versus the consumptive use, which means that it must be evaporated off for cooling and non-consumptive meaning that it is returned to its source.

Once your cooling is non-consumptive, it will withdraw a large amount of water. As you can see here, almost a quarter million AFY has been drawn off in a typical 500 MW combined cycle. When we compare this to the other technologies that can cool a power plant, such as wet cooling towers or dry cooling, we see that the amount

withdrawn per year is substantially year.

Dry cooling is obviously the most efficient in its water use in terms of being able to produce 500 MWs of power and only use 230 AFY of water.

Depending on what a power plant chooses for its cooling system, there is a potential to affect fresh water supplies locally, and the quality of surface and ground water locally, or the marine bay and estuarine ecosystems.

In 2003, the Committee did adopt a policy that stated that fresh water for cooling purposes would only be considered where alternative water supply sources and alternative cooling technologies are shown to be environmentally undesirable or economically unsound. Those terms are defined in the 2003 report.

The results that we have seen is there is a reduction in fresh water, fresh surface water and ground water use in our state for power plant cooling. There has been a large increase in cooling with degraded and recycled water, and applicants are beginning to consider alternative cooling.

You can see that in this slide which we have in the report. While these are sources that could be used for municipal uses, we've seen the total fresh water potable use since 2004 and prior has been decreasing from what was 24 percent to only 20 percent of the power plants that are under construction permitted, but delayed, or in review currently here at the Energy Commission.

Another source of fresh water, which is in competition is ground water, and we've seen it decrease from 34 percent to only 11 percent of our siting cases. As you can see, most of the siting cases here at the Energy Commission have proposed recycled water use, and this is more than doubled as a part of this policy and also because of the availability of recycled water is increasing dramatically.

The second policy that came out from the 2003 IEPR regarding waste water reuse, and this is looking at zero liquid discharge technologies which can compress your waste water into a small cake and return the waste water to the power plant for continued use in cooling towers.

As a result of this policy, waste water discharge is being reduced, protecting surface



water supplies and ground water supplies, and water is being conserved because it is being returned to power plants.

Again, as we show in this year's report, zero liquid discharge, those power plants are currently under construction, permitted or delayed, or in review have increased from 35 percent to 46 percent of the fleet or almost 7,000 MWs.

In water resources, we continued to have a few concerns. Once-through cooling at existing and repowered plants perpetuate water quality impacts to coastal and bay aquatic resources. I won't go too far into that because there is a discussion tomorrow morning on that.

Where hydroelectric facilities operate, they can cause significant habitat and water quality effects. Water use at power plants can be reduced significantly compared to traditional uses at households or in agriculture and can be conserved for these higher and beneficial uses.

The trends that we will track and continue to see is a competition for fresh water as populations increase is also going to increase. Also because of economic development in our state.

We see a trend that power plant water use can cause significant local impacts, and we can do our part to try to protect that and reduce that to its lowest level.

Since 1996, new power plants are using less fresh water per MW, and this has been through the increased use of recycled water and more efficient cooling technologies such as dry cooling.

the final two trends are the use of zero liquid discharge system is reducing water quality effects to surface and ground water and is contributing to water conservation. As of 2005, only 25 percent of FERC regulated hydro power projects meet or will soon meet current water quality standards. This should be addressed to avoid on-going and under mitigated impacts to rivers and streams.

We present three times for you consideration as the Committee. Staff would be ready and willing to update our siting review guidelines for local agencies that are currently permitting power plants less than 50 MWs to allow them to know what we've learned about water supplies and also about water conservation

technologies so that they can be applied at the local level.

Second, we could help establish a program that could evaluate for local entities or even for the power plant projects we have in-house, alternative water sources and water conservation opportunities.

This could also be applied to facilities such as bio mass with increasing pressure to go for a renewable portfolio standards. We should look at both their water use there. We promote the continued research and development of water spray enhancement of air cooled condensers, which is being done through PIER, and I believe you saw that presentation by Joe Haggin at the Water Energy Relationship Workshop, and this is promising that this can improve power plant efficiency while reducing water use.

I'll take any questions on water resources and/or if you had a question about the data requests that went out this year.

PRESIDING MEMBER GEESMAN: I guess the only question I have is whether you could elaborate more on your second bullet there, what type of program do you envision being meaningful

in evaluating alternatives at existing plants?

MS. NELSON: My primary example is that if you had a once-through cooling power plant in a coastal area, that we would give an evaluation of what alternative water sources are available for them, what the costs would be, what infrastructure needs to be put in, and try to not just tell them there is a problem using once-through cooling, but actually here is a solution and here is the most cost effective solution we found in your area.

PRESIDING MEMBER GEESMAN: Is that something that you would envision being raised at the MPDS permit process? Where is the leverage?

MS. NELSON: Basically the leverage is only that in order to be consistent with state water policy, you should look at -- well, as part of our data adequacy regulations, we have them looking at alternative water sources as part of the data adequacy for siting cases here. You could be stronger in saying that as part of that provide economic analysis, be sure that alternative sources such as recycled water -- you know, expand on your data adequacy regs, so that before they even come to you in a siting case, those would have been evaluated, but we could help

with that.

PRESIDING MEMBER GEESMAN: I'm focused on the words "existing power plants relying on fresh water", and I am assuming perhaps incorrectly that they have either a contractual or permit right to their existing source of cooling water. I don't know a single altruistic power plant owner. I am sure there may be some hypothetically. Let's say that you did establish such a program and devaluated a very attractive source of recycled water for one of these existing power plants. How would you ever get them to make the shift if they've got either an existing contractual or permitted right to their existing water source?

MS. NELSON: We really have to try to learn their business needs, and as part of that, it is -- I already have it, I already know how it works, I already know how much it costs, but if we found that there was any uncertainty, they weren't sure how much it was going to cost, they weren't sure that supply was still going to be there, then they would themselves be starting to look at alternative water supplies and would come to us.

We did have one of Calpine's projects

come to us and ask for a change from ground water to recycled water as a result of the recycled water supply being put in literally at their power plants border.

PRESIDING MEMBER GEESMAN: That was a project that we had licensed?

MS. NELSON: That is a project that we licensed in 1984. As populations increase and everybody starts looking at am I still going to be able to provide power plants, or within my district, am I going to be able to use the ground water or surface water that power plants are using for something else like population agriculture. You might see a push to get those power plants off, so we won't know if perhaps the city or county might make a regulation asking for power plants to consider alternatives and then they would have a solution center here that they could come to. We are just I think at a cusp of where people will be pushed financially and just because of risk am I going to lose that supply coming to us.

I think it would be important to incorporate a lot of economic and business needs not just environmental needs into this type of

program.

PRESIDING MEMBER GEESMAN: Thank you.

COMMISSIONER BOYD: Natasha, I was puzzled by your -- I liked the rest of the discussion, but I was puzzled by your initial response which was an ocean cooling plan, and I focused in on the fresh water component, and thought, yes, there are some possibilities, and I thought this has some merit. I can think of a couple of things permitted even on my watch that may be people could go back and look at. I was thinking, though, of fresh water, like state project water and what have you. I didn't ever call ocean water fresh water before.

MS. NELSON: I am very sorry about that. We did have a discussion two weeks ago splitting off the ocean water discussion into biology section, and although it was I guess I still feel ownership of it because it was something I was promoting. So, I misspoke, and in this particular instance for water resources, and you will probably see something similar come up in biology. We can do a lot just on the fresh water.

COMMISSIONER BOYD: Right, you are forgiven.

MR. SMITH: Natasha, quick question on your third bullet. The research focus is on a particular method of increasing efficiency and dry cooling. There are other issues relating to dry cooling that makes it feasible or infeasible at a given site: size, noise, esthetics, visual, etc. Is there consideration for a broader research program on dry cooling other than water spray enhancement or in addition to water spray enhancement, looking more comprehensively at addressing other issues related to dry cooling?

MS. NELSON: There was a PIER workshop that I was unable to attend on May 20 and 21, and John Kessler our consultant is here, and did you go and see if they had additional types that they were -- it was PIER's workshop trying to look at alternative cooling technologies.

MR. KESSLER: I was not able to attend that either, but in response, there are some designed parameter flexibility that is kind of inherent with dry cooling which can help mitigate size, noise, those kinds of factors. Our intent with this bullet was just to focus on the ability to reduce water use while being able to enhance the efficiency of the cooling process, but there



is nothing that prevents us from looking to broaden the scope of that type of study to look at in general, these are the kinds of problems as you mentioned and the opportunity to include those in comparative studies on down the road to look at ways that are more readily accessible to us to say that this is the way that we can typically mitigate those kinds of impacts.

MS. NELSON: I think a business might have several needs like you said --

COMMISSIONER BOYD: Mike's point is a good one and maybe this committee and the whole subject can look beyond that. I for one have been subjected in power plant siting cases to lots of discussions if not arguments about all these factors. That is probably why Mike is remembering the size, noise, etc. etc., so that is an interesting set of questions.

PRESIDING MEMBER GEESMAN: Thanks, Natasha.

MR. MCKINNEY: Natasha hinted at this, but she wore several large hats during the preparation of the '05 EEPR, so first off, she was tasked with leading the development of the data request of the Environmental Forms and

Instructions and did (indiscernible) job on that. There was a biologist and the biology chapter, and then late in the game won the supervisory position for the Water Unit, so she has really been running all the bases on this one.

I think I mixed enough metaphors in there. I would like to introduce Rick York who is the new supervisor for the Biological Resources Unit, and we are going to be seeing a lot of Rick over the next couple of days.

MR. YORK: Thanks, Jim. For the 2005 EEPR in the Biological Resource section, there are two main areas of this report with regards to biology. They are broken up into two parts. We have terrestrial habitat issues and aquatic habitat issues.

First off, I am going to give you a very broad brush discussion of what we've discovered as far as habitat loss and then move on to nitrogen deposition issues. Linear facilities, new gas transmissions lines, and gas pipe lines, and move on to avian collision issues, electrocution issues, and then on to wind turbines in particular.

For aquatic habitat impacts, I'm going

to discuss very briefly once-through cooling, the trends we see there and talk a little bit about things that Jim knows a great deal about, the hydroelectric facilities development. So, I am going to break this up into two parts.

With regards to habitat losses, since 1996, the Commission has permitted a number of new power plants projects, 23 are actually operational representing more than 8,100 MWs. For these that we have permitted that are operational caused a permanent loss of over 1,000 acres, 895 acres were natural lands habitats. 144 acres were primarily developed lands.

Even though a majority of these projects were essentially on agriculture lands or industrial sites, the transmission lines along natural gas pipelines that were associated with a few of these projects that are permitted and are currently operating were aware of the major impacts occurred to and related to habitat loss. In particular these projects were located in the Mojave Desert in Western Kern County.

There is some good news if you can think of any good news associated with habitat loss. 14 of the 23 projects were required to provide some

form of habitat compensation. Numbers range rather small amounts to some rather significant amounts of habitat that were required. For these 23 projects that are operating over 2,200 acres were required for habitat compensation.

On to nitrogen deposition. Nitrogen deposition becomes a concern for projects that are located primarily in the Bay Area but also in San Diego County. We struggled with this issue on a number of siting cases. The nitrogen emissions from power plants in the Bay Area in particular are a contributing factor to habitat changes. When a native plants are replaced by non-native plants and a non-native plants are no use to the protected invertebrates, butterfly species in particular, these are federally protected species, these non-native plants are virtually no use or no use to the butterfly species for food, and as a result, this fertilization of these nitrogen poor areas with NOx emissions, ammonia emissions contributes to a change in these habitats. As a result, there are fewer and fewer areas where these butterfly species in particular are found.

The major contributors are not power plants, they are vehicles. However, as I've said,

we've struggled with this issue with official Wildlife Service in particular on a number of projects in the Bay Area and in the San Diego area as well. We have required and mitigation has been provided by the applicants and involved thousands of dollars and actual habitat purchase in addition to providing funds.

The Energy Commission's PIER Program is actually involved in inventory for the state looking for areas that we feel in the future if there are siting cases proposed for these areas, where are these nitrogen emission issues going to be something that we are going to have to struggle with on future power plant siting cases.

New linear facilities, we have a number of new ones in California, new natural gas pipe lines, and new transmission lines. I expect there will be more. These new facilities since 1996 and these are not ones that were permitted by the Energy Commission. These are just major ones that we have new in the state, and since 1996, over 300 miles of these new facilities are located once again in the California desert and other arid environments.

Impacts to these areas, they are

associated with construction and maintenance of these facilities are mitigated for by purchased land and also by restoration projects. Often these impacts are considered permanent. It just takes a very very long time for these areas to recover. If no disturbance happens, however, as you can see in this case here, there are roads that are often associated with these facilities, or there is a natural gas pipe line or power plant transmission line, and these areas are particularly prone to impacts being there for many decades and hundreds of years.

What we would like to see is that through the Energy Commission permitting process that we continue to do what we have done in the past siting cases which is to encourage fewer new corridors and utilize existing corridors whenever possible.

Avian collisions and electrocutions, primarily a transmission line, a distribution line issue. Since 1996 our focus in California has been to try to research how big of a problem this is and to develop ways to reduce these impacts. Problem areas have been identified in this state, and some of the owners of these facilities have

made retro fits to these facilities which is good.

There have been improvements to the guidelines on how to construct and how to protect from these outages, however, these standards have not been adopted across the board.

However, we have found devices such as you can see here in this picture called "bird flight diverters" have been shown to have some beneficial effect when located on certain problem lines. We've also required that these be placed in certain areas for certain lines that we have actually permitted on a number of projects, in particular in Kern County where condors are known to be found.

Once again, the PIER Program has been involved in research of ways to understand these issues and develop mitigation measures, and we are looking for them to implement some of these new techniques, new devices, and monitor their effectiveness. We will be reporting more on that in 2007.

Another issue with regards to birds, collisions with wind turbines. It has been estimated that 1,700 to 4,700 birds per year including hawks and owls are killed in the

Altamont Pass wind resource area in Alameda County.

Other wind resource areas we have in California do not seem to pose this kind of threat. Altamont seems to be unique, but as Jim mentioned earlier, the Montezuma Hills area, Solano County may have similar concerns.

What we are seeing in parts of the state is there is maybe a current trend to repower some of these areas that have lots of smaller turbines. As you can see in the picture here, this is what they use to look like. I was unable to place another picture in this slide, there just wasn't enough space, but there are plans and this is happening that new larger turbines are replacing because they are much more efficient or replacing these areas that have a lot of the smaller less efficient turbines.

The jury is still out as whether the new larger turbines pose less of a threat, but if you place them in certain locations and this is where the research is on going now, there are attempts to study the effect of moving them and placing them in areas that appear to be less of a threat, and we will be looking to work with the PIER



program to see how these new measures are implemented and monitoring their effectiveness.

PRESIDING MEMBER GEESMAN: I thought there was also a claim that the higher blade elevation was an important factor in the larger machines and that also the avoidance of the lattice towers was a significant factor as well.

MR. YORK: There is a number of things about the new larger turbines that appear to -- people feel that they will see over time and there will be less of a threat. The lattice tower does pose a problem because it offers a perch opportunity for birds. The tubular towers are shaded with these much larger turbines appears to be a way of dealing with that, no place to perch on the tower itself.

PRESIDING MEMBER GEESMAN: Now in Solano County region, are we dealing with green field development, or are we replacing older machines there as well?

MR. YORK: I believe that is new development, and it is with the larger turbines.

PRESIDING MEMBER GEESMAN: Are we going to get into this tomorrow?

MR. YORK: Definitely in the afternoon.

You will hear a lot about this from Melinda Dorin tomorrow afternoon.

PRESIDING MEMBER GEESMAN: You might pass on to her, I have a particular interest in going into some detail as the basis for any conclusions that can be drawn here. You used the verb "feel" perhaps inadvertently in describing people's opinions, and I would like to know what statistics we have been able to develop, and what forms the basis for trying to draw any conclusions here.

MR. YORK: I'll see Melinda later on today, I'll pass your comments on to her.

Moving on to aquatic habitat impacts and concerns. You've heard a little bit about once-through cooling. I'm not going to go into a lot of detail about that today, but coastal power plants use once-through cooling is a concern to us. We still have 21 coastal power plants that use once-through cooling, however, we know there is talk of possibly closing down some of these for a variety reasons.

Hunter's Point appears to be on the short list. I believe Long Beach the last time I checked was not operating. There is talk about

replacing the Humboldt Bay Power Plant, and there is a fourth one that is not coming to me, Petrero, possibility of closing the Petrero Power Plant in San Francisco Bay as well.

PRESIDING MEMBER GEESMAN: I think there's also been an announcement that the South Bay Project which is supposed to come in to us for new licensing would also contemplate no longer using a once-through cooling system.

MR. YORK: We are going to talk a lot more about this tomorrow. I know that Chris Ellison will be on our panel tomorrow, and we specifically asked him to come speak on behalf of Duke because I believe when he made the comments to you at a workshop, he was representing Duke at the time. He said that Duke was interested in doing just that, looking for an alternative cooling water supply, possibly moving the power plant away from the shoreline. The new concerns about once-through cooling was something that was causing them to have that opinion that they probably wanted to get out of the Bay some day soon.

We may have fewer of these facilities in California, however, we think a number of them

won't be around for quite awhile. They make a lot of sense for a variety of reasons. However, we may also see one of the things that will continue to promote them to be around for awhile which is additions of one or more desalinization units on some of these projects. It appears that a number of these facilities will have desal units either as a pilot project or as a fully functional unit probably in the not too distant future. These will extend the life of these facilities, in particular if they are sharing the intake and getting electricity from the power plant.

As a result, the addition of these units were likely to see the continued impacts to the local coastal eco systems.

PRESIDING MEMBER GEESMAN: Now, Rick, we looked at this last year in the aging plants study, and the best that we were able to come up with was a coastal commission evaluation that went plant by plant. The assumptions were various vintages. Have we got new information or current information on a site specific basis on which projects are likely to have co-located desalination units?

MR. YORK: I consulted with Tom Luster

on this, and I've got a list in our report here that talks about the most current list of ones that we think are likely and currently under study and are likely to have a desal unit affixed to it. Yes, it would be something that would be permitted or evaluated through the coastal commission process.

COMMISSIONER BOYD: On this point, having spent all day last Friday in a desal power energy conference in Southern California, I found it necessary to bone up on the subject. Of course, our own energy water interface report has quite a few different pages scattered throughout on desal and the varying, extremely varying estimates from different sources, the 2003 task force that this Commission participated on had an estimate the 2005 DWR water plant update had a much more conservative estimate. I learned in this conference of two plants that are being considered for piggy backing like Huntington Beach and Encina I believe.

I also was introduced to an incredible controversy on the subject and extensive quoting of this report right here on once-through cooling by members in the audience, so there is a lot of

uncertainty, and this is very expensive desalting sea water is extremely expensive proposition. One does wonder how in spite of lots of people's views of what a wonderful easy source this is, there is a lot of economic and obviously environmental questions being raised about it, so it is a interesting and fairly newly revived topic.

PRESIDING MEMBER GEESMAN: I think that if I recall properly the flavor I took away from our water and energy workshop here a week or ten days ago was the expectation that it would be much more likely in the near term to see these desalination technologies deployed to desalinate degraded fresh water, and that it may very well be a little bit further down the road before you see the ocean desalination projects going forward on anything other than a demonstration type project.

COMMISSIONER BOYD: That is exactly the way I came away from our energy water workshop, and when you go deeper into it, the economics and a lot of the practical aspects of it, it does seem to be a much higher priority and more economical and environmentally benign application than going straight to sea water, but it remains to be seen.

MR. YORK: I know the Coastal Commission

shares our concern about the affects on the coastal eco systems, that is one of the environmental issues that may be the reason why they are looking for these other water supplies.

What I have in the report here, and I won't read it to you, Mr. Luster did indicate that Haynes and Encina have small pilot desal facilities I belie right now. They are also reporting that desal is being considered for Moss Landing, Ormand Beach, (indiscernible) El Sugundo, Huntington Beach, and San Inofra the last time I talked to Mr. Luster.

One of the things that we started gathering information on was what the new NPDS permit renewals under the new regulations, what if any changes we were seeing made to any of these facilities based upon these new regulations. It is still very early in the permit renewal process, and we haven't seen anything as of yet. However, in 2007, we will probably have a lot more information to provide what changes or technological requirements are placed on these facilities for their new permits.

Since 2000, the Energy Commission has licensed four power plant projects and allowed for

the use of once-through cooling to continue. We are not stopping anybody from using once-through cooling.

Moving on to hydroelectric development. As Jim mentioned earlier, we have a significant portion of the hydroelectric fleet in California that is up for relicensing by 2005, and this is a once in a lifetime opportunity according to Jim for us to bring these facilities to conformance with modern science and new regulatory standards.

One of probably more interesting things that we've gotten involved with here at the Energy Commission is our assistance to Fish and Game and the State Water Board with regards to selective decommissioning. They are looking for our guidance as to looking for low power/high impact projects that are currently out there and that could be considered something that can be replaced or taken out. We've been involved with the Klamath relicensing, and where the agencies determine that decommissioning some of these facilities is a viable option and they have asked FERC to evaluate this option during relicensing, the relicensing process.

For the Kilarc-Cow Creek Project, it was



determined that the environmental benefits of removing this small facility outweighs its electricity generation benefits.

PRESIDING MEMBER GEESMAN: Where is that located?

MR. YORK: Kilarc-Cow?

MR. MCKINNEY: The Kilarc-Cow Creek facility is a small 5 MW plant owned by PG & E, it is in the Butte Battle Creek Basin which is the upper northeast part of the Sacramento Valley.

PRESIDING MEMBER GEESMAN: There was a project decommissioned in Ventura County last year, was there not?

MR. MCKINNEY: There's the Big Mattila Project that is undergoing final feasibility studies for decommissioning. There is no power related with that facility.

MR. YORK: We do have a few policy ideas for your consideration, however, the majority of them are associated with once-through cooling in the avian collision and electrocution issue, and I won't be going into those today. They will be discussed I'm sure at length tomorrow morning and tomorrow afternoon.

For habitat losses, like I said I would

like the Commission to do what we've always been doing is to continue to use brown field sites, try to avoid impacts to natural habitats, and in particular for new corridors, once again, try to get others to use existing corridors out there in the Mojave Desert and other places and try not to be licensing too many new corridors.

PRESIDING MEMBER GEESMAN: I guess I am troubled there. The permitting system for these linear facilities is such a hash right now that I am not persuaded that our simply saying do this is likely to translate especially well. I guess I would like you guys to mull that over a bit and determine if the permitting jurisdictional issue continues to be as clouded as it currently is, whether there is something that could be more forceful in trying to revert to what I think you guys called Garamendi principles based on the first time that advisory guidance was provided I think now more than ten years ago.

MR. YORK: In siting cases try to abide by the Garamendi principles.

PRESIDING MEMBER GEESMAN: I know we do. I am more concerned about other agencies that may not feel similarly constrained or have the same

orientation. I'm not certain that's been a particularly closely felt concern among various stakeholders thus far. I think if the state is incapable of better addressing this linear permitting issue, then perhaps we should consider something with more teeth in it than simply recommending the use of existing corridors.

MR. YORK: Good point. On to hydro, three ideas here we would like to expand a level of understanding of the environmental damages of the hydro electric facilities. We would like to be allowed to continue to provide support as we have been in the past with regards to energy and energy cost issues with FERC.

As we look into this evaluating selected decommissioning of these low power/high impact projects, and we would like to also encourage if we could the state to provide sufficient funds and staffing to participate in the relicensing project and proceedings.

I'll take any more questions if there are any.

COMMISSIONER BOYD: None from me, thank you.

MR. MCKINNEY: We will now be moving on

to the community resources part of the report. We have two presentations. The first report will be Eric Knight who has done a lot of work in land use and I think currently is doing work on transmission issues. He will give the land use portion of the report, and then Dale Edwards will come up and talk about the other three which are cultural, social, and environmental justice.

MR. KNIGHT: Good morning, my name is Eric Knight. I am a staff member in the energy facility siting office. As Jim mentioned, I used to work on land use issues on siting cases and then moved into the visual resources area, and now I am presently a project manager.

Power plant siting occurs on a lot of different environments throughout California, both urban and rural areas. Both settings have their advantages and disadvantages from both the developers perspective and from a land use compatibility perspective.

Urban areas typically offer the availability of brown field sites and previously disturbed sites and an industrial operation may have once operated there. These are beneficial from the developers perspective because there is

an available infrastructure typically, gas lines, water lines, nearby power lines, and also being close to the load center. There aren't as much transmission losses in transmitting that power to the people who need it.

From a land use perspective, this often means that since these are in urban areas, that development of power plants occurs in very close proximity to residential areas, schools, recreation areas, which can present some land use compatibility and community concern.

PRESIDING MEMBER GEESMAN: It would seem, though, from our experience with the Magnolia Project in Burbank, the Pico Project in Santa Clara, the two repowers that the City of Los Angeles has done, the municipal utilities seem to have been able to grapple with this urban location issue pretty successfully.

MR. KNIGHT: I would agree, but I'm thinking of a few other cases that we worked on, the Los Medanos and Delta Energy Center projects in Pittsburgh. There was concern. Those two plants, at least the Los Medanos in particular, was within an industrial area, a heavy industrial. There were things like Dow Chemical, nearby Coke

handling facility. Those industrial areas are very old, U.S. Steel mill was I think probably one of the first industrial developers there. A lot of the housing stock that is nearby I think was actually I think at one time company housing, but in the interim, you know, more industrial did come in, and actually new housing has come in, in very close proximity to that plant and the old PG & E Pittsburgh plant. So, there are these issues to deal with in an urban setting, not unsurmountable.

Urban sites sometimes tend to offer less opportunity for physical separation or buffer, but again, it is not impossible. On the Los Medanos project was a good example where an electrical transition structure that was needed for a power line that was underground through the City of Pittsburgh and popped up above ground towards its destination point to a substation was sited very close to residential areas and within view of several homes. So, landscaping was planted up around it to screen it.

The expansion and modernization of older plants takes advantage of existing infrastructure, doesn't commit new land to a new use, it has been a power generation facility for 50 years. Many of

the state's oldest facilities are located on the coast. Modernization expansion of these facilities has been controversial since now the coast is used as a visual recreational and ecological resource worth of protection of state law.

Recently approved modernization of two coastal plants, I am thinking of El Sugundo repowered project and Amorro Bay Project include measures to enhance visual quality that was degraded by the existing facilities themselves and also to improve public access to coastal recreational areas. Those plants are very close by to state beaches and both of those developers provided improvements to the coastal access which is a key concern on the coast line, one of the key concerns.

Power plant siting also occurs in rural areas. The availability of large low price parcels compared to a similar sized parcel in an urban setting is one of the advantages to a developer. These sites also tend to provide greater opportunity for physical separation and buffer nearby sensitive receptors. Typically, there aren't very many out there, so that is

helpful too.

However, building plants within rural areas can present significant land use impacts and particularly if they are built on agricultural lands. Seven projects approved by the Energy Commission in 2003 and 2004 were built on ag land and will permanently convert 261 acres of farm land including 60 acres under the Williamson Act contract.

The Commission found the impacts to be significant in four of these cases. They involve prime farm land, farm land is a state wide importance or were under the Williamson Act contract and required mitigation for the loss of 186 of these 261 acres.

In addition to compatibility with surrounding land uses, power plant proposals involve concerns about compatibility or consistency with local land use plans and ordinances. Since 1996, four project required a general plan or zoning change because the designation on the parcel wasn't such that it would allow development of a power plant. Local government approves changes in three of these cases. The one hold out was the City of San Jose



on the (indiscernible) Project, and I am sure everybody knows the Commission used its override authority to approve that plant.

PRESIDING MEMBER GEESMAN: They ultimately ended up supporting the project, did they not?

MR. KNIGHT: Yes, they did. That's true. There have been several instances since 1996 where local government has adopted a resolution in actually opposing the siting of a power plant within their jurisdiction. This was the Neuva Azalea Project in the City of Southgate. Then another case where local government refused to negotiate -- well, I shouldn't characterize that way -- where local government did not approve the lease (indiscernible) Project. Although the Commission has exclusive jurisdiction to the site power facilities, we can't force a local agency to negotiate a lease of their own land, city or county land to allow development of a project. That was the United Golden Gate Project in the City of San Francisco at the airport.

There is a land use policy option that we identified in the paper was that the Energy Commission could consider providing assistance to

local government and preparing energy elements that address the siting of energy facilities. This would be in the interest of minimizing conflicts, land use conflicts and future siting cases.

I think the track record is pretty good in the 49 some odd plants that we have seen since 1996, there has only been a handful of them where the developer picked a site that didn't have a zoning designation appropriate for a power plant. Maybe through some assistance, they could prepare energy elements that could maybe provide a little more guidance to developers on site selection criteria, and that is the second bullet I just added as sort of clarification that the Energy Commission could coordinate with local government developers to create site selection criteria for energy facilities.

There is an example of this as the Colusa County transmission line element which I think possibly the Energy Commission funded back when we had a siting assistance program and we provided grant funds to local government to prepare energy elements.

It doesn't actually designate corridors

per say for transmission lines, but it does identify -- it has maps and it identifies sensitivity maps which signify preferred locations. They don't go out and say this is the transmission corridor, but I guess you can infer from these maps what areas you've got to stay away from and where you've got to site the transmission line.

PRESIDING MEMBER GEESMAN: Was there a line put through Colusa County?

MR. KNIGHT: I'm not sure about that. It kind of goes back before I was here. Most of the energy elements we went through follow the general plans for states and counties, and most of the energy in all this we found dealt with conservation and not necessarily with siting of an energy facility.

I think, too, through this effort, we can assure that lands are appropriately designated, and if there are lands that are already designated for transmission lines, power plants, that they are preserved for future facility development and they are not allowed to be encroached upon by an incompatible land uses which we hear quite often from electric

transmission facilities that say we have a power plant existing right of way, we have a line in it, and we need to upgrade it from 69 KV to something greater and they can't because they are hemmed in there. Development is occurring around them.

That concludes my presentation if there are any questions.

MR. TOOKER: I just wanted to clarify for the record that Eric Knight is using a set of slides that was updated from the one that was printed out and handed out here today, and we will provide copies of those. They do provide some additional information.

PRESIDING MEMBER GEESMAN: Thank you.

MR. MCKINNEY: I'm not going to put you on the spot, Eric, but I did want to kind of pursue a discussion we had last week. Coming in to developing this report, one of the questions I had is how is the current system which is a three-legged stool we have from a State Energy Planning and Policy at the broadest scale, we have local governments exercising their land use jurisdictions, and we have the market with merchant developers identifying what they see to be the ideal sites for new generation. My

question coming into this is how is that system working because it is really not coordinated to a great extent, and I see that a couple of your policy options here seem to seek to get at that, and I just wanted to ask you to elaborate a little bit on your thinking and how you thought through these issues as you were writing this chapter.

MR. KNIGHT: I've heard the same concern you have, the system is broken, you know, they pick the sites, and then they bring it to us. If you look at purely zoning consistency as an indicator, and there is a table in the appendix to the report which goes through the projects that were approved in 2003 and 2004 and zoning consistency is one of the indicators that was tracked. It was tracked in the 2003 report.

What I found in 2003 and 2004 is that none of the facilities that came before us required a change like a general plan and then a zoning change. They were always either zoned that allowed power plants by right, a zoning code says they are a permitted facility, or they are conditionally allowed facility meaning the local jurisdiction had permitted authority over the project, would have the discretion to deny it, but

I think typically what it is, is they are a type of use that they have community effects, and so the local jurisdiction wants to control them, put mitigation on them. That conditional use permit is assumed into our process here. There is no need to grant a conditional use permit in a siting case in a power plant greater than the 50 MWs.

What the Commission has done in those cases is it has asked the local jurisdiction what conditions would you impose on a facility, and they are typically brought into our process and they appear as conditions of certification. From that indicated alone, it seems like the system is working fairly well. In '96 to 2002, there were the four plants that we mentioned that required a zoning change, and three of four of those cases, the local agency approved the change. It didn't delay the process, so taking aside it is already properly zoned and streamline the process to some degree.

There have been cases where the project hasn't comply with a certain provision of the zoning code, like a height restriction. We have seen that one a lot of times. Again, that requirement to get a variance from that regulation

is folded into our process. We typically ask the local agency to tell us would they approve it if they had jurisdiction and if so, with what conditions, that has worked well.

We don't know what the future holds, and I don't think just because it has been working pretty well, I think we could work more cooperatively with local government and with developers. Maybe this isn't a pre-filing setting. We have prepared a draft guidelines on site suitability criteria which we could make available if the Commission thinks it is a good idea, and maybe it is available on our website. We have lots of information available to developers. It can be presented to them in a pre-filing meeting or something.

PRESIDING MEMBER GEESMAN: I guess I have a fairly different take on it. I certainly think avoidance of friction with local government is a desirable objective, and I would agree that based on that criterion, the status quo has worked quite well, but I think that is a pretty low threshold, and we need to hold ourselves to a higher standard as a state.

I think that as renewable sources of

electricity become a larger part of our new supply mix, we are going to find those are a much more geographically deterministic type of resource. I also think that providing adequate transmission facilities to fully develop those renewable resources is likely to be a driving factor in where new transmission facilities are located.

I think that as the state moves into a more planning oriented paradigm, and you just need to look at the additional planning responsibilities the legislature has put on our shoulders the last couple of years to see that we clearly are moving to a more planning determined permitting environment. As we move in that direction, I think we can actually provided a constructive assistance to local government by indicating where the transmission corridors are likely to be and as a consequence, where the likely sources or sites for new generation are likely to be, both renewable and conventional.

I think in fairness to a situation that does entail a rapidly growing population that we are going to provide that proactive guidance to local government if this is expected to work in the future remotely as successfully as it has in



the past.

MR. KNIGHT: Thank you for your comment.

PRESIDING MEMBER GEESMAN: Thanks, Eric.

MR. EDWARDS: It is not morning anymore, good afternoon, Dale Edwards with the Environmental Protection Office. I just wanted to follow up on one thing what you were just talking about is the last part of this line here is to insure that lands that are designated are preserved for future energy facility development. That probably swings more towards the transmission line side because that is really is the problem that we mostly experience as Eric was saying, there is a lot of consistency as far as the power plant site selection with zoning.

That is an area that because at this point in time, we don't have authorities in that area, it is difficult for us to jump in with both feet, but I hear you clearly and that is why we put this bullet up here is to move off in this direction to start assisting with the information that we can bring to bear on that such as corridor development or identification and all the issues that go along with it.

I'm going to pick up with Eric left off

with cultural resources, and first of all, I want to thank the staff who helped to write this section and put it together actually, both Beverly Bastian who is a new cultural resource specialist with the Energy Commission and Dorothy Torres.

I am just going to hit the highlights of these three sections I am going to talk about: cultural, social economics, and environmental justice, and this is going to be relatively brief.

We wanted to point out that one of the things that is perhaps general knowledge if you work in development in general because Native American tribal groups have been getting more involved over time as we might call it progress or at least as development encroaches upon their lands or their interests, or more specifically sacred sites or traditional practice areas.

Because of that, we have had a couple of new developments in very recent time here with SB 18 which was just signed by the governor in September of '04, which now requires local governments to consult with Native Americans with they are dealing with general plan or specific plan changes, and SB 18 also allows for tribes to establish conservation easements for specific

types of areas. I am not going to be specific on that.

In addition regarding the relicensing of hydroelectric facilities, FERC has just established a new tribal liaison position and requirement for consultation in these proceedings. That is a major step forward as well because as you know, as it relates to hydro relicensing or hydro developments, it often times does directly affect Native American interests as far as fishing.

Also to point out just one additional element is we have seen in the last year or so that California tribes at least or some of the tribes have been exploring the use of environmental justice as another means or pathway of protecting their culture resources and their traditional lifeways. We may see more of that in the future, and that is an interesting aspect of cultural resources because it is typically at least the way this Commission deals with Native American issues, it is through the cultural resource side, but now it is kind of leaning over into the environmental justice aspect as well. Not to us directly yet, but potentially in the

future.

For social economics, this section was written largely by Joe Diamond, but also with assistance from Nagarva Heedy with Aspen Environmental Services and just to hit the highlights of this section and for this report, the renewable portfolio standard will stimulate economic growth and increase of renewable sector employment primarily in the manufacturing area.

This is good because we are seeing this other trend which is that the modern gas-fired power plants are using less personnel for operations than the older steam plants do, and that is looking at the modern gas plants. They use anywhere from 2 to 24 employees typically for a plant for operations whereas the older steam plants are 40 to 50 employees, so we are dropping off substantially from the old employment history at least, and the renewable program is actually helping that out and we do have some numbers that provided in the report.

Overall, for transmission generation and distribution, looking at the years 2002 to 2012, there is a 12 percent increase in employment expected.

For the final slide regarding environmental justice, and this was written by Amanda Stinnick, a staff person in our environmental protection office, as of the 2000 census, ethnic minority groups now comprise the majority of the California population. As a result, as we've been seeing in recent time that the environmental justice connection to our siting cases for power plants is almost 100 percent. Whether you are talking a rural or urban environment, we do see that we are going to typically have a population that tips the threshold that we use to say that we are going to consider environmental justice in our analysis.

Lastly, this is not our recommendation, but we are looking for Commission consideration of another thing that is very close to what Eric is talking about is his last bullet that the Energy Commission and the electric generation industry should work together to develop site selection criteria to avoid adding impacts to disproportionately impacted low income and minority communities.

In line with this, the Energy Commission -- it may not have happened quite yet, but I know

it is in the works, the Commission is trying to establish a study or a grant to a group that is going to provide a new tool. This is a joint funding opportunity with the CEC and Cal EPA for the development of a new tool that is going to look at populations in a whole different way before a project is developed to identify basically the risks to that population that exists today versus what they may be at in the future. So, it is a tool to better identify what you might call EJ populations, or at risk, or disproportionately EJ populations.

I think that once it gets developed and put into practice by Cal EPA agencies or Board offices and departments as well as the Energy Commission. I think that will take us a step further of effectively dealing with environmental justice. That concludes my presentation.

PRESIDING MEMBER GEESMAN: Thanks, Dale. We've got two blue cards, what I contemplate doing is breaking for lunch and then coming back after lunch to deal with out of state power, but let me give both of the blue cards an opportunity to address us now if you would care to, otherwise, we could simply defer your comments until after the

out of state power presentation.

The first one is Steven Evans from Friends of the River.

MR. EVANS: Good afternoon, I appreciate the opportunity to address comments before we break for lunch. I am Steven Evans, I am Conservation Director for Friends of the River, which is California's statewide river conservation organization.

We are a founding member of the California Hydro Power Reform Coalition which consists of 30 conservation recreation organizations working to restore river values and aquatic eco systems that have been impacted by hydroelectric development in California.

We would like to thank the Commission for its continued recognition of the environmental impacts of hydroelectric projects in this state. For far too long, hydro power has been considered renewable and clean, and although certainly the source of fuel for hydro power, water is renewable, it is far from a clean generating source of electricity.

As the Commission has noted, there are 384 FERC regulated and federal hydro power

projects in California affecting virtually every major river system in over 90 percent of the rivers in the Sierra Nevada.

These projects have a wide and deep impact on the environment. They flood large amounts of habitat to create reservoirs, they alter natural flows. They create and maintain habitat, transport sediment, and provide biological ques for fish and wildlife. They dewater reaches of rivers, they alter temperature of water quality, and they block migration, and segment populations of fish and wildlife.

Dams and diversions in California from hydro power have especially deleterious effect on California's once robust populations and migrating salmon and steelhead, almost 90 percent of the former historic salmon steelhead habitat in the Central Valley have been blocked by hydroelectric dams.

The renewal of the federal license by FERC for hydroelectric projects in California gives us a once in a lifetime opportunity to clean this source of electricity up, to restore river values and aquatic eco systems while continuing to generate power.



Over 150 FERC licensed dams, that is roughly 37 percent of the hydro power in the state will go through relicensing process in the next ten years. State and federal regulatory agencies and NGO's such as Friends of the River and its fellow members of the Hydro Power Reformed Coalition will be working in that process to insure that environmental mitigation are part of the license, and the Energy Commission is an important partner of that process. As was mentioned previously this morning, the Energy Commission has been very helpful in assessing the importance of value of hydro power from specific projects as well as identifying potential replacement power from renewable resources.

There are many older hydroelectric dams in this state that no longer are cost effective in terms of operating, particularly when you account for their environmental impacts and the Kaleric-Cow Project and the Klamath River hydro dams are just two examples.

However, I have to note the passage of the energy bill recently by Congress will make the environmental mitigation in the relicensing process a bit more difficult, so it is even more

important that the Energy Commission maintain and expand its role on this important process.

PRESIDING MEMBER GEESMAN: What do you see the impacts of the energy bill being?

MR. EVANS: Primarily, it is going to make it more difficult for state and federal regulatory agencies to set conditions for environmental mitigation because the energy bill increases the opportunity for utilities to come up with their own alternatives to specific conditions. We are concerned that process will once again weight the process in the favor of the utilities and focus more on generation rather than environmental mitigation.

We have a number of points we would like to bring out -- I am going through my thing here so I can shorten this. I don't want to take up a whole lot of time. We support the Energy Commission's recent efforts to collect information into a hydro power data base in order to systematically assess the effects of hydro on a state wide scale. A clearing house of information related to the hydro power's footprint on the state's contribution to energy in the environment would foster better quality and more strategic

decisions about the role of hydro power in California, particularly at the FERC relicensing level.

Furthermore, this level and quality of information will give the Commission the resources to craft the more environmentally efficient distribution of hydro power across the state.

In future reports, we think the Commission should consider state investments and water use efficiency reclamation and conservation. Of course the Commission has been a leader in supporting investment in energy conservation in efficiency, and there is a very important connection between water conservation and efficiency and the use of energy. The State Water Project is the single largest user of electricity in this state.

It uses the electricity to move water from parts of the state that have it to other parts of the state that don't. Further, an increased investments in efficiency and reclamation conservation will reduce water demand and therefore reduce that energy use.

Increased investments in that area will also buffer the relatively uncertain impacts of

global warming on both water and energy demand.

Let's see, finally in terms of some of these older hydroelectric projects to jump back for a moment to looking at these older projects in their relicensing to determine whether it is cost effective to maintain or upgrade them to meet environmental standards, has been noted old infrastructures is very expensive to upgrade.

The public cost to resolve fish passage issues passed eight small hydroelectric dams on the north and south forks of Battle Creek in Northern California is now estimated to be \$90 million. That project would remove five of those eight dams and build very very expensive fish ladders and fish screens and reattach and redesign new plumbing to maintain and operate the remaining three.

Our analysis indicated that its cost competitive to actually remove all eight, and one of the things that is sort of blocking the ability to move further and consider that alternative, removal of all eight dams, is the source of renewable replacement value.

Again, the Energy Commission's role in taking a look at that in the relicensing process

is very important. With that --

PRESIDING MEMBER GEESMAN: You are speaking of the replacement of the electricity generated?

MR. EVANS: Correct.

PRESIDING MEMBER GEESMAN: Okay.

MR. EVANS: If there are any questions, I will answer them. Otherwise, thank you for the opportunity to speak.

PRESIDING MEMBER GEESMAN: Thank you for your comments.

Audrey Chang, Natural Resources Defense Council.

MS. CHANG: We can hold and look at comments for later.

PRESIDING MEMBER GEESMAN: Why don't we break for lunch, and why don't we resume at 1:30.

(Whereupon, at 12:20 p.m., the workshop was adjourned, to reconvene at 1:30 p.m., this same day.)

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## AFTERNOON SESSION

1:30 p.m.

MR. MCKINNEY: This afternoon's session will be presenting results of a staff paper. It is a preliminary environmental profile on California's electricity imports. Before I get into the presentation, Commissioner's, advisors, do you have any opening remarks, or any questions, or any such things. With that, I'll get to it.

Before I dim the lights and go into this, I really want to acknowledge the outstanding contributions from Aspen Environmental Group. So, Sandra Alacom-Lopez was the Project Manger for this for Aspen. Will Walters did a tremendous amount of work on assessing the air quality data that we put together. Suzanne Finney is I don't know is like a part of our staff these days, she just lives here and kind of picks up these really complicated technical areas and does a great job. So, thanks very much to Aspen for their contributions to this report.

I guess the first question on this is why develop a environmental report on out of state power. First of all, we have now done three quite in-depth reports on the environmental aspects,

profile, footprint, what have you of California's in-state generation resources.

Over time, it has become clear to us that what's going on out of state is a bit of a mystery and it is an incredibly important part of our resource mix here in California. We really don't know that much about it.

The island mentality no longer applies to a lot of the ways we think about resource integrations, supply to demand balances, resource adequacy. The increasing concern on having an electric transmission system that can easily import and export resources from California throughout the Western U.S., Canada, and Mexico makes it clear that we have an obligation to start to report on the environmental aspects of that electricity that is generated and imported into California.

The need for this report is also driven by the increasing concerns over climate change and the sources for greenhouse gas emissions that are attributable to California. So, we know pretty closely what they are in-state, and we know actually pretty well what they are out of state these days. Again, that is one of the drivers for

developing a report like this.

First off, I need to give a big disclaimer. This is a preliminary screening report. This will not have the polish or focus of our in-state EPR's. It is not to denigrate the report at all, there is a tremendous amount of information here, but what we've done is compile as much information as we can and present it to the Commission, other agencies, and other stakeholders for use in their various proceedings or actions.

Some of the questions that I had in mind when we started scoping this report last fall had to do with procurement at the CPUC. There has been a little bit of action on Co2 emissions and possible greenhouse gas adders. Didn't seem to be a lot of supporting data to go along with that, so we were hoping that internally staff in the Environmental Office with Aspen could really work closely with staff in the Electricity Analysis Office and others to really flush out the environmental profile for this out of state power for use with the PUC during procurement.

We've just had far too much work to do, and there has been some major issues that have



hindered that effort. Again, we are presenting a staff report within which are data that people can use.

Another question that has always been of interest to me is that in the action plan and loading order, about four or five bullets down, there is a statement that clean central station power shall be kind of occupying that rank in the loading order. I've yet to see a definition on clean central station power. I know what it looks like in California, it looks like a combined cycle plan that doesn't use fresh water or sea water for cooling.

For out of state, I'm not quite sure where to begin defining that, and I am not sure that other agencies have taken that up either. Again, we are compiling information and presenting it with the hope of offering some data to some other actors and players.

Another thing we do in this report is to identify key generation sources and the trends and the development of those sources as you saw from the morning session. You can't have a good environmental understanding without understanding your resource mix and where it is headed and how

it operates. So, we do an initial stab at that here. I do note that our Electricity Analysis Office is also going to be providing a report on the resources within the Western Electricity Coordinating Council as part of the IEPR report series.

This is what we hope to accomplish today. I've already talked about purpose and intent. I will review the findings and go through kind of the broad brush areas here. So, I will talk about generation resources, broad brush environmental issues and trends, and then I am going to turn it over to Will Walters from Aspen who will report on the data that we developed for this report.

Let me say that as we collect the data for this, the Aspen team went out and really beat the bushes on every state within the WECC and used a lot of EIA data to compile that information.

Joe Loyer of our Air Quality Unit further compiled a data base and did some interesting assessments on emissions that Will will talk about a little bit later.

Again, if you were here this morning,

you will know that we talked about California imports, about a third of it is electricity in any given year from out of state resources.

For accounting purposes, we are considering all electricity generated outside of this state regardless of ownership or control to be just that out of state, so we calculate a higher level than does our Electricity Analysis Office, which has identified about nine percent of the power coming into the state that is either wholly or partially owned or controlled by in-state utilities. That totals about 9 percent.

The dedicated plants, the 9 percent I've got there, if you break it up by MW, it is 6,200 MW. A good chunk of that is coal, there is some natural gas, and a little bit of nuclear in there as well.

The resource mix varies by region. Obviously Columbia Basin, Snake River hydro is a big element in the Northwest. Coal seems to be the predominant fuel source in the Southwest.

One of the findings of this report is that coal is an important but hidden part of California's electricity supply. So, of the 6,200 MWs of dedicated power that I mentioned, about

4,750 MWs of that is what we call dedicated coal. Again, we will be talking about that in more detail.

For the period 1996 to 2003, we identified about 15,000 MWs of new gas capacity that was brought on line in the Western U.S., and that mirrors the trend that we saw here in California as well.

Looking to the future, the fuel of choice seems to be coal, and there are a lot of implications to that.

We identified 27 new plants in various phases of development, and I will talk about that a little bit more later. Not surprisingly, the out of state emissions both total and in terms of emission factors are higher for out of state generation than for in-state. A lot of this is driven by the use of coal.

Also not surprisingly, water use as in California is an issue of concern for power plant development, and in some states, it is a limiting factor, and dry cooling has been used.

The hydro power impacts in the Pacific Northwest to salmon fisheries, also it is nothing new there, but it is one of the major

environmental factors that we pulled up here.

We also see an on-going trend in renewables development as California utilities require more of that resource for their use to meet RPS.

COMMISSIONER BOYD: Jim, before you leave this slide, you mentioned this morning, but I let it slide until this afternoon, the fact that the rumored -- I don't know if they are rumor or factual, 27 new coal plants, and mostly you pulverized coal combustion technology leading to your second bullet of out of state emissions are higher than in-state. This both troubles me of course and puzzles me a little bit in terms of the emission requirements of other states.

Certainly nobody holds a candle to California, but I was of the mind that western states were doing better these days. They had been driven so much by visibility issues, etc. etc. down through the years. I am just wondering if you can elaborate at all on the air quality requirements of other states vis a vis California and this technology because so many of the people who came and spoke to probably many commissioners and even pre-commissioner days talking about

bailing California out by building out of state coal plants and wheeling power here kept talking about, well, we will build clean coal, we will build a IGCC or something, you know, super clean because we know it is California. Was that all just puffery as far as you can ascertain?

MR. MCKINNEY: I'll give a bit of an answer then I want to invite Will or Sandra to come up and elaborate on that.

COMMISSIONER BOYD: Am I getting ahead of part of your program?

MR. MCKINNEY: Just a bit, yeah, I am going to go into that further --

COMMISSIONER BOYD: You can defer the answer.

MR. MCKINNEY: Okay, we will wait until that part of the presentation.

I think the only thing in here that I have not mentioned yet is we do get dry power from both Canada and Mexico. For the 2003 reporting year, about one-third came out of the Northwest and two-thirds came out of the Southwest.

Let me say a few more things about scale and reporting here. The time series that we looked at for this was very narrow. It is

generally the 2001, 2002, and 2003 period. So, we have tried to capture trends as best we can, but that is a very short time span for a region of this size.

Most of the data that we used is good, but it is also kind of preliminary or cursory, and it is sort of very broad scale. It is a very large geographic area, a lot of capacity that we are talking about here. So, the types of statements I am making are quite general. Again, Mr. Walters will go into more detail when he talks about emissions.

One of the big drivers and how much power comes in is what there is, is the in-state hydro generation contribution, whether it is going to be out of the Pacific Northwest. That tends to drive the way other power gets dispatched and generated in the West.

Here you can see the breakout by capacity and generation. This was using 2002 data, so as you can see on a capacity basis, coal, natural gas are about second tier, and we have quite a bit of hydro up in the Northwest, and then the nuclear and a fair amount of renewables.

I call this the pac-man chart. It is

quite fun and colorful and especially for an after-lunch presentation. Unfortunately, it did not make as I understand it, the report that is available to you outside, so I apologize for that, and we will have to do an errata on here.

The easiest way to look at this chart. This is 2002 data generation by fuel type by state, so the bright pink starting up in the Northwest is hydro power. The even brighter green is coal. Again, you can see how that plays out in the Southwest here.

Yellow is gas, you can see that is about half of California's resource mix, a good chunk of Nevada's, not very much in the rest of the states.

Moving to again what I call the dedicated coal plants, there are six of them, and this lists out their capacities and ownership. The next figure I'll show you provides locations. You can see the Navajo Station 2,400 MWs, Los Angeles Department of Water and Power. The Reed Station quite a bit smaller at 600 or so MWs, it is a DWR facility. Mojave, another LA DWP also co-owned with Edison 1,600 MWs. Four Corners is another Edison facility, or at least half of the ownership is through Edison. San Juan 1,800 MWs,



bigger split in ownership there. Then Intermountain facility at 1,600 MWs.

MS. JONES: Jim, I have a question. You are looking at the installed capacity in the regions. Have you then just attributed that same relative percentage across the imported power that comes to the state, or have you used some other methodology to actually calculate how much of the power that comes to California is attributed to any given source.

MR. MCKINNEY: Yeah, I didn't talk about data at all or methods, so let me do that here.

I won't say it is the dumbest guy method we could use, but it is close to it. The real way to get at how much power is coming from which generation resource at which time is to access the contracts. That was far beyond our ability in this report.

What we did is I think based on 2002 data, we figured out what is the relative proportion in the resource mix between fuel types for the entire Western U.S. We then took that ratio and applied it to the electricity that we knew that was coming in, in any given year. So, we had a total number of GWhs and we apportioned

the resource mix of that same ratio that was used for generation within the Western U.S.

It is crude. I think it is informative, but it is by no means definitive. There are some things that we are going to miss in that.

MS. JONES: When you looked at capacity, installed capacity for say hydro power, was it derated in those years depending on the water conditions, or was it just installed capacity?

MR. MCKINNEY: I think it was installed capacity, but Will's got an answer here.

MR. WALTERS: Actually, we did the generation through 2001 to 2003, and they were weighted for the actual amount of generation for each of those years. If there was a light year that kind of showed up in the total mix for hydro for those three years.

MS. JONES: Because we had particularly dry conditions in the Southwest those three years, and we had some below average conditions in the Northwest during that time period, that would then drive more natural gas and coal into the resource mix, is that correct?

MR. WALTERS: It would based on our method, but at the same time because of all the

dedicated coal that we do have, we may be low based on an averaging technique for the entire region, so it may sort of make up for that differential.

MS. JONES: Okay, thank you.

MR. MCKINNEY: By dumb guy, I was referring to our staff, not the Aspen staff on the methodology we used. We spent about two months figuring out how to do a method would serve our purposes within our time frame.

This figure shows the locations of the again what we are calling dedicated coal facilities in the Western U.S. It is a good figure so you can see for yourself how they are distributed.

Commissioner Boyd, this will get to your question a little bit more. This figure in Table 3.1 in the report goes into a little more detail about the 27 plants that we identified here in the Western U.S. that are either proposed, have received permits, were under construction, they total a little less than 16,000 MWs.

PRESIDING MEMBER GEESMAN: Can you break that down, what are proposed?

MR. MCKINNEY: I went through the Table

3.1 and charted this out last night. Ten of the facilities are proposed, twelve are under permitting, three are in the construction phase, and two are inactive. Commissioner Geesman, you asked this morning if we had any information on the break out between merchant and utility power. I just went through the table at lunch, identified twenty proposals that appear to be merchant and seven that appeared to be utility-based.

Ten of these are up in the Northwest, seventeen are in the Pacific Southwest. One of the other pieces of infrastructure that has been proposed in the Western U.S. is the Four State Frontier Transmission Line that is proposed to access the cleaner coal technologies and winter resources in the Northern Rockies.

Another one of the findings here with kind of this trend in coal power is that it is probably going to displace the previous growth trend that we saw in natural gas resources.

Again, a little bit more information on those 27 facilities. We identified 24 that will be using pulverized coal combustion technology, and one of those which I think is the Sempri Plant in Nevada is proposing to use selective catalytic

reduction.

We did identify one integrated gasification combined cycle facility, it was a smaller one in Idaho, and two using the circulation fluidized bed combustion technology.

This is a thumbnail sketch of the major environmental effects associated with imported power. So, the higher rates and levels of air emissions from coal and natural gas, again, Mr. Walters will talk about that after I finish this part.

In terms of climate change emissions using the information out of the Climate Change Report, we estimate ten percent of the power sector -- the power sector contributes ten percent of emissions in California through in-state generation. If you factor in the out of state imports, that goes up to about 20 percent.

Another major topic area is impacts to aquatic resources from hydro power in the Pacific Northwest. Again, water quality and water supply as related to development of new coal facilities and natural gas plants in the Southwest. That is what it says, nuclear.

I think we covered this to a fair amount

this morning, but for those of you who weren't here this morning, these are a kind of laundry list of standard impacts from development and operation of hydro power facilities, pretty much wherever they are placed. So, it does eliminate and substantially change habitat which is a contributing factor in the loss of biodiversity.

It changes river flows, it alters nutrient cycles. It radically changes the temperature regimes, and again in the Northwest, it is particularly notable that it blocks fish migration (indiscernible). There is a fair amount of injury and death to fishes as they try to migrate downstream during out migration and have to pass through the turbines.

In the Columbia River/Snake River system that was quite visible in the news over the last few years with some of the proposals to take out the Snake River facilities, so we got some more information, but the salmon and steelhead runs up in that system have dropped from a historic high to about 16 million fish per year to the current level which is about one million fish per year.

There is a lot of work going on to improve the efficiency of fisheries passages or

the passage of (indiscernible). Again, up and down river, there are some trap and haul schemes where you remove them from the river, put them in the barge, and take them around the rivers. It seems to be somewhat effective, but it doesn't seem very efficient to me. Anyway, there is a lot of work going on in the Columbia Basin on these issues.

There are also a lot of facilities that are regulated by FERC, the Columbia System is a federal system, so it is not under FERC's jurisdiction. With relicensing, we see a lot of the same trade offs and opportunities that we see here in California, so there has been some selective decommissioning as a more cost effective way to meet the mitigation requirements than to do upgrades to meet current clean water right standards or fishery passage standards.

I also asked the Aspen team to look more generally at dam decommissioning. They identified 177 dams throughout the U.S. that have been removed, although I imagine most of those are not power dams.

All the facilities that you see listed in the first bullet use large amounts of water for

power plant cooling. Again, as noted, that can be a limiting factor or a constraint as new facilities are developed in the West.

We've also seen more conflicts in the use of water between power supplies and other uses. So, some of the mitigation in other parts of the Western U.S. is the same here, so it is alternative water cooling supplies. That means recycled water, reclaimed water, dry cooling has been used in several large facilities, and then zero liquid discharge to minimize the amount of return discharges to aquatic eco systems.

For the Palo Verde Nuclear Station, there is a lot of discharge of treated waste water to the Gila River, which creates a series of environmental effects there. Another big water user is the Slurry pipeline that is used to transport coal to the Mojave Generating Station.

That concludes the first part of the presentation. Again, this was a cursory overview, there is quite a bit more information on the topics that I covered there in the report, but for now, I am going to turn it over to Will Walters of Aspen who will talk in more detail about air emissions in the Western U.S.



MR. WALTERS: Good afternoon. We came up with four major findings after evaluating the data from the out of state power plants. The first was that imported power on average is higher polluting than in-state power. For some pollutants, it is quite a bit more polluting NOx for example and Sox. It is not really comparable at all with the coal that is used out of state.

Mostly imported power does not generally seem to contribute to the non-attainment areas in the Western States, the ones outside of California, at least not significantly contribute. I'll show you some slides that newer non-attainment areas that kind of bear that out.

Imported power is not a major source of air toxic pollution or significant contributor to air toxic risk in the Western States. This finding was also found by EPA. In fact, it was one of the things that I found in looking through the recent clean air interstate rule and mercury rule.

COMMISSIONER BOYD: You just said the word I was looking for, including mercury.

MR. WALTERS: Including mercury. In the western states, actually, the main mercury sources

are not power plants. Gold production, geothermal, and other mineral processing smelters are a much bigger source than the coal power plants, at least in the West.

COMMISSIONER BOYD: Is this a difference between Western coal and Eastern coal. I think it could partially be a difference to that respect, and I think also there is just a lot more coal being used in the East proportionately than it is in the West.

It is a function of the size of the area and the amount of MWs being produced as well as the quality of the coal itself.

Also we found that the imported power sources include dedicated coal plants may be a significant contributor to specific class, one area regional haze problems. Obviously, Grand Canyon is a noted example with Navajo and Mojave.

Just to give an introduction, imports into California are generally from the Western states, but there are some imports that come in from Canada and Mexico where you didn't have any solidated to present for Mexico, so it is not actually in any of the resource mix data that is being presented, so that is one of the limitations

of this study.

From the Southwest, as noted previously, most of the power in the Southwest is from coal-fired power plants, and California utilities own a little over 4,700 MW of the coal-fired power in this Southwest states, and just to detailed Southwest versus what we are calling Southwest versus Northwest. Southwest is Arizona, New Mexico, Nevada, Utah, and Colorado. The Northwest includes Washington, Oregon, Idaho, Montana, and Wyoming. Where the top three in the Pacific Northwest have a very different resource mix than Wyoming and Montana which are much similar, more similar than the ones in the Southwest.

In the study time that we looked at, imports are roughly one quarter to one-third of total consumption in the State of California. Apportionment to any particular source, as we noted before, is difficult. I think deregulation has made it even more so. Since power can be sold several times and trying to track all that down, particularly since our study included 2001, and we all know what happened during 2001 with power contracts.

Imports will certainly increase in the

future if for no other reason than cost. I think it is easy to see with natural gas prices going up, essentially tripling oil head prices in the last six years, coal is going to continue be a more cost effective option for bringing power in as long as the transmission can handle it.

Now just to describe the fuels and technologies that we essentially deal with in air quality, obviously nuclear and hydro really are not part of the mix in terms of what we have to deal with. They had some secondary impacts, maybe some minor PM 10 emissions from both, but nothing significant. So, we are generally dealing with coal, natural gas, and a few other miscellaneous waste to energy, geothermal to some extent.

Obviously coal contains a lot of nitrogen and sulphur, trace metals, they also increase the amount of pollution from coal combustion. Natural gas is a much cleaner fuel, lower carbon to btu rating, so it has a lower base line CO2 emission per btu or per MW, so it is greenhouse gas emissions are less.

In terms of technologies, as I noted the non-combustion technologies, whether it is hydro or geothermal or nuclear, they generally have no

direct criteria pollutant emissions or very low direct criteria pollutant emissions.

Boilers are less efficient than combined cycle technologies whether that would be an IGCC or what we normally see in terms of natural gas combined cycle technologies, therefore, they have higher Co2 emission rates just due to the differences in efficiency.

In terms of plant specific emissions, regardless of the fuel technology, they are very strongly a function of the amount of control that is required as has been alluded to in terms of what states will require what level of control for the different types of power plants.

You can certainly make a plant a lot cleaner than the ones that are out there right now. The question is how much cost are you willing to put on to the applicant.

This shows again the basic resource mix. Rather than showing each state, this shows the total, the Northwest Region and the Southwest Region just to give you a feel for the difference between the two. In fact, if we had moved Montana and Wyoming out of the Northwest Region, the hydro power would have been dramatically higher than it

is now with those two states in the Northwest.

One thing that I looked at to determine or try to determine effects of power plants and how they were impacting the local air quality of different states was something similar that we saw in the in-state analysis which was what percentage of the state's emissions are coming from power generation. This shows in particular shows the high levels of NOx and nitrous oxide and NOx and sulphur dioxide, SO2 that are emitted from those states that have a high proportion of coal.

In some cases, even one or two power plants, if those states don't have other high sulphur dioxide emitting facilities like smelters will create a very high proportion. Like, for example, the State of Washington, essentially 60 percent is from power generation which can be pretty much pointed to the Centralia Plant, coal plant in Washington. Whereas other states where you think might have higher levels because of their really high coal mix such as Montana where it only has a little over 40 percent, that is due to the fact that they do have other industries that create a lot of SO2 pollution, smelters in the case of Montana. Arizona has copper smelters,

so those are things that you have to take a look at or trying to understand the effect of the power plants in terms of the attainment status or the general air quality in those western states.

PRESIDING MEMBER GEESMAN: What is the primary source of particulate matter in those other states?

MR. WALTERS: I think a lot of the particulate matter is actually from natural sources in a lot of those states, particularly in the Southwest. A lot of it is going to be wind generated, and some of it is going to be mobile source generated from dust as well.

I didn't actually take a look at the particulate in the same way that I did the SO<sub>2</sub> and the NO<sub>x</sub> since the numbers were quite a bit lower.

PRESIDING MEMBER GEESMAN: It might be helpful to segregate that.

MR. WALTERS: We can do that, the data is there. In terms of the air quality issues that we found, obviously the coal-fired power plant criteria pollutant emissions are substantially greater than from other technologies and other fuels that are used in the West and certainly greater than those that we see in the State of

California.

Also the greenhouse gas emissions obviously are going to be higher on average due to the fact that there is a large amount of coal being used and the carbon to hydrogen ratio is just so much higher than with other fuels.

Oh, another issue is the regional haze, Class 1 area impact issue that we've seen the Grand Canyon and a few of the other western Class 1 areas. In the western states, not including California, there are 79 Class 1 areas. There are another 29 in the State of California. That is 108 of the 156 in the country. Obviously, it is a major issue. You are going to have a hard time being able to put a power plant that isn't within 50 km or 100 km for a Class 1 area in very many areas of the west.

Non-attainment areas, power plants don't appear to be major contributors to the non-attainment areas that are in the western states, the ones outside of California.

For mercury emissions, power plants are not the major source of mercury emissions in the West. I wouldn't say that of the East, but I've reviewed the data available from the EPA, and



there are other industries that create higher mercury emissions. In fact, the No. 1 state for mercury emissions is California which has almost no coal power plant generation in comparison to the other western states, and it comes from a number of other industries. Nevada is the No. 2 state, and most of its emissions come from gold mining.

To go into a little more detail about the non-attainment situation, I'm showing two particular non-attainment pollutants. I think they are both relevant to the resource mix, a heavy amount of coal. They are also more relevant because they are new designations. In the case of whether it is one hour ozone or the other designations, many of them are very old, and some of those areas actually are non-attainment now, they just haven't gone through the paperwork, so I didn't want to put a chart out that showed a bunch of non-attainment areas that are only non-attainment on paper. I didn't really have the time to go through and figure out which ones those were.

These are very new designations. They were just done last year. You can see the

difference between California where more than half the state is non-attainment, these are PM10 meet our ozone standards versus the other western states where there are three areas that are non-attainment for the eight hour ozone. They are all major metropolitan areas in the West: Las Vega, Phoenix, and Denver.

There is one PM2.5 non-attainment area Libby, Montana. To tell you the truth, I have no idea why that is a non-attainment area. I tried to call Montana, and they didn't seem to be home last week. I did take a look at the year's data available on EPA, and I didn't find any of their coal-fired power plants are anywhere near that area, and there aren't any in Idaho. Although I know there is quite a bit of other industry in Sandpoint, and there have been some PM10 issues up in the upper part of Idaho. There might be some transport. Other than that, it is probably a Mountain Valley problem with really bad winter inversions.

Now in terms of the regulatory issues and the regulations that will be affecting both the existing plants and new plants in the western states. The first is new source review where if

the provisions of this rule as they have been done in the past are not weakened, it will insure that low emissions from new plants and issue reductions when plants are modified. That being said, probably most of us know of the recent case that just happened on Friday that did back the weakening of the new source review provisions for plant modifications. It was done in one of the appellate courts, which is why I noted if not weakened. I prepared this slide before that ruling came out, but I was afraid that would be the case.

There are two new rules that have come out in the last couple of months, Clean Air Mercury rule. It is a cap and trade rule which will reduce mercury emissions approximately 70 percent nationally against the cap and trade rule. That means that any specific facility doesn't have to do anything in terms of reducing its mercury. It is the same as the Acid Rain rule. They can buy credits from other states. So, it is really hard to say how much mercury reduction will be done in the western states.

For that you have to have a little bit of background in what's going on with the existing

plants and whether or not additional SO2 controls which generally create the additional mercury reductions will occur. There is some additional SO2 controls that is slated for Mojave, assuming they don't shut the plant down rather than put the controls on. So, we might see at least some reduction in Mojave. Otherwise, they may buy credits as necessary to stay under the state caps.

This rule is specific just to power plants. Each state has a budget, and like I said, they will be able to maintain their budget through buying credits from other states if those states have over controlled their emissions.

The other new regulations is the Clean Air Interstate rule. That rule will affect NoX and SoX pollutants from power plants. However, none of the western states are included in that rule. Unfortunately, as the Skies Act was originally identified and the emission reductions that were identified for the western states don't appear like they are going to happen, at least due to this rule making since nothing west of Texas is affected by the rule.

Since there was a passage of the Clean Air Mercury Rule and the Clean Air Interstate

Rule, it is unclear if there will be additional regulations through the Clean Skies Act to clean up power plants in the West. This may essentially end what was going to be done for the Clean Skies Act. I had conversations with folks in Region 9, and they are not sure if any more regulations for western power plants will be forthcoming any time soon based on the Clean Skies Act.

PRESIDING MEMBER GEESMAN: Just to be clear, it is the Clear Skies Act, is it not?

MR. WALTERS: Oh, sorry, Clear Skies Act.

The other regulation that is in effect for all states with Class 1 areas, the Regional Haze Rule. Plans for the Regional Haze Rule will be due December 2007, and those plans will likely include long-term strategies to control power plant emissions where they found they are impacting those Class 1 areas. There is degradation of visibility. In the case of at least dedicated coal plants, I believe I've seen at least four or five of them implicated as being potential contributors to various Class 1 area problems.

PRESIDING MEMBER GEESMAN: Who is

responsible for coming up with the Regional Haze Plans?

MR. WALTERS: Those are required by the states.

I just wanted to give some background on the assumptions we used in our analysis. As Jim noted previously, they are a little bit different than you saw earlier in terms of the fact that for emissions, we count where the emissions occurred. We are not trying to follow the electrons quite so much in terms of the overall western resource mix because we are more concerned with how much NoX was emitted in Arizona versus whether or not that NoX was owned by California or not.

In terms of the import power assumptions. Again, this is 2001 to 2003 weighted averages, so if I go back again, you will see that those averages will be weighted more strongly than 2003 than 2001 since there was more import in 2003. As you can see, the coal is roughly 40 percent. Hydro power is just another percent behind it, and natural gas, nuclear renewables and the other make up the other approximately 20 percent that is assumed to be imported.

The total in-state power by technology

or by fuel/technology for 2001/2003, this is a combination of the in-state and the import where you can see the natural gas still dominates because in-state is approximately 70 percent of the total, and the import is only a little over 30 percent. Hydro power is 23 percent and coal is about 14 percent.

These are the assumptions and limitations that we had in terms of our study and in terms of the data we could use. As I noted, we have simplified Western States Resource Mix that we brought into the state and have assumed for import.

We are also using simplified western states emission factors. We did not have specific emission factors for all of the facilities nor did we have lists and generation rates for all the facilities in the western states.

We do have specific dedicated coal plant emission factors and generation rates. So, the data that we were able to come up with for dedicated coal at least does use more specific information, and as Jim noted earlier, accuracy would be increased if we could get plant by plant emissions and import contract information for all

the western state imports.

This next slide presents a summary of the emission rates that are from imported power, the in-state power, and how it affects the combined total emission rate for California consumed power. As you can see, the NOx emission rates are roughly four times that of the in-state for the import. Obviously most of that is due to the coal from the western states. The Co2 numbers are a little less than twice the in-state.

I think I will go through the next few slides fairly quickly since they are fairly detailed. This shows the in-state NOx emission totals which were presented previously in the in-state report which shows that the in-state Nox is turning down towards .3 pounds per MWh.

The out of state NOx emission totals, and again all of this data is 2001 to 2003, shows that the NOx emission rates and you might pay more attention to the line above that shows the emission rate than the actual number of tons. I think it is more of an indicator or a better comparison between the technologies. Tons are more of a comparison about how much generation there is. You can see that the out of state



numbers are turning well over one pound per MWh.

The import numbers are very close to the total out of state number. Of course, that is based on the assumption that we are using the same resource mix as the average resource mix for 2001 to 2003.

The combined NOx emission totals obviously are increased from the approximately .3 to about .6 with the addition of the 30 percent import power.

The in-state Co2 emission rate is approximately .4 tons per MWh. The out of state rate varies between about .5 and .6 tons per MWh. That is the same as our import assumption. The combined Co2 emission totals are generally between .4 and .5 tons per MWh.

This slide shows the dedicated coal NOx emissions. Again, the line I think is more illustrative than some of the other bars. Some of the other bars just indicate how big the power plants are and how much generation there was. This shows that the NOx emission rates have ranged in the last three years from about six pounds per MWh turning down towards four pounds per MWh.

PRESIDING MEMBER GEESMAN: What would

explain that trend?

MR. WALTERS: The only thing I can think of -- I am not aware of any additional control technology would just be efficiency gains through the power plants and/or changes in the coal composition. If the nitrogen rates were to go down slightly, there could be some coal cleaning potentially as a pre-combustion going on at one or more of the plants.

I am not aware of that, but I would say based on the level of change, it is probably more than could be counted for by efficiency, so it probably would be a reduction in the nitrogen content of the coal. That may just be a natural phenomenon based on the particular mines.

PRESIDING MEMBER GEESMAN: When you say efficiency measures, what do you mean by that?

MR. WALTERS: I mean that as plants go on, there are little things you can do to tweak it to make it a little more efficient, a few percent here, a few percent there, but as you can see, the emission reduction is close to 50 percent, so I don't think you can get a 50 percent increase in a boiler.

Although we are showing a similar trend

in the Co2 emissions which I also can't exactly explain. Some of it, again, could be efficiency. I wouldn't think there would be a huge change in the carbon/hydrogen ratio, but answering some of these questions, if Joe Loyer was here, he might be able to give you a little more technical expertise as to why these things are dropping.

A summary of those various charts, as I noted, the nitrogen oxide emissions from imported power are about four times the in-state average. Co2 emissions are approximately 1.4 times the in-state average. Two pollutants we didn't show on charts, but we did discuss in the report, PM10 is approximately two times the in-state average. SO2 is more than 150 times the in-state average. Again, that is strictly based on non-fuel types, the fact that we use natural gas here in California and really do not use any high sulphur fuels with the exception of maybe 80 MW of true coal we have.

I think most of the generation that we identify as coal was really pet coke, so sulphur content of pet coke is generally pretty low.

For dedicated coal we decided to make that comparison rather than the in-state average

to the in-state natural gas-fired average. So, at least we are comparing technology to a technology rather than a technology to a state average. For that, the dedicated coal plant emissions are roughly for nitrogen oxide roughly eleven times higher than the in-state natural gas fired average per MWh.

The CO2 emissions are roughly 1.7 times the in-state natural gas fired average for MWh, and the PM10 emissions are roughly 3.4 times the in-state natural gas fired average for MWh.

PRESIDING MEMBER GEESMAN: What you are calling the in-state natural gas fired average of blends the new combined cycles with the old steam plants?

MR. WALTERS: And cogeneration. Everything is natural gas and the peakers. Any natural gas generation.

For my concluding slide, I'm presenting some of the new technologies and comparisons with technologies that we see in-state that are on the left, the F frame and H frame turbines, although we only have one H frame turbine being proposed right now or one site with H frame.

It is the future, so I decided to

present it. In fact, these are two specific siting cases, so they provide a real comparison.

The other data is coal based technologies. There is the baseline pulverized coal, that is a specific plant, that is the Round Up Plant in Montana. Those are the permitted levels. That plant might be easier to see on the screen --

PRESIDING MEMBER GEESMAN: No it is not. Tell us what the colors are, okay.

MR. WALTERS: The colors. The blue is NOx, the red is PM10, and the yellow is Co2.

The other technologies are IGCC. They are in the middle, and just to the right of that, is a super critical PC boiler, to the right of that is an ultra super critical PC boiler. To the far right is the fluidized bed second generation.

You can see that the PM 10 rates for the IGCC and the fluidized plant are essentially negligible, and in fact, are even lower than the gas turbine. Although, again, these are permitted values and not real values. We've seen, at least on F frame turbines in general, we are testing to about a third of what we were permitting for PM 10, maybe up to a half.

As you can see for NOx or what I should say for NOx is that there is a considerable variation in the level of control that is identified here. In some cases, the specific level wasn't identified in the resource that I was able to come up with emission factors for specific technology. I believe the two PC boilers could probably be controlled considerably more. They do have SCR, but it probably could be done more aggressively with a higher percentage, more in line with the actual baseline pulverized coal plant. If not, even better than that.

The Round Up Plant, for your information, is noted to be 90 percent control for NOx total with its combustion control technologies, over fire air and I think it is a lean combustion and the SCR total combined is a 90 percent control from an uncontrolled.

If you look at that number, you can see that uncontrolled is very similar to what we see for the dedicated coal plants which makes sense because there is no NOx controls besides minimal combustion controls on the dedicated coal plants.

That is the end of my presentation. Do you have any questions?

(No response.)

PRESIDING MEMBER GEESMAN: Thank you,  
Will.

MR. MCKINNEY: Commissioners, that  
concludes staff's presentations on the Out of  
State Power Environment paper. At this point, I  
think I will turn it over to you for comments from  
the audience.

PRESIDING MEMBER GEESMAN: I've got two  
more blue cards. The first is Audrey Chang,  
Natural Resources Defense Council.

MS. CHANG: Good afternoon,  
Commissioners. My name is Audrey Chang from the  
Natural Resources Defense Council. Thank you very  
much for the opportunity to provide our comments.  
I will keep them brief today, and we will expand  
more in our written comments.

First off, I want to thank staff for  
their hard work, and we definitely appreciate it.  
As NRDC is an environmental organization, we are  
definitely concerned about the other environmental  
impacts that the EEPR has outlined, but we focus  
our comments on the out of state power.

First we commend staff for an excellent  
first start at looking at out of state power since

it is very important part of our electricity mix. Our first recommendation is that should the out of state power analysis should be integrated into the rest of EEPR and into all of the relevant sections of the EEPR.

From my understanding, the section on the air emissions chapter that Mr. Ringer presented did just focus on in-state power, and we believe that the out of state emissions contribution should also be integrated and presented in one location.

A few other suggestions that we have is that we support the development of the out of state data base, and we suggest that scenario modeling be performed to look at future emissions Co2, NOx, etc. that could result. One thing that might be helpful with that that we recommend is collecting fuel type specific information from all the serving entities in the resource planning process.

Another suggestion is that transmission losses also be looked at since that will definitely affect the emission rate per KWh delivered to California.

I'll wrap it up there, and, again, I



will definitely expand on our comments in our written comments. Thank you.

PRESIDING MEMBER GEESMAN: Thank you.  
Jane Turnbull.

MR. MCKINNEY: Excuse me, Commissioner, if I could address one of the points that Ms. Chang made. In terms of projecting ahead into the future, part of our work plan was to build an emission factors into the natural gas scenario work at our Natural Gas Unit and Electricity Analysis Office Unit are doing. Due to a series of delays in that work product, we were not able to integrate our emission factors into the projections, but I think it is point well taken, and it has been part of our work plan.

PRESIDING MEMBER GEESMAN: Jane Turnbull, League of Women Voters.

MS. TURNBULL: Good afternoon, Commissioners and staff. I really want to commend everybody for today's presentation, both this morning and this afternoons. I think both of these make very clear the importance of the IEPR process. The information that has been presented has been comprehensive, and I think one of the benefits of it is that it leads to an increasingly

proactive approach to energy policy planning.

As you are well aware by now, the League is very supportive and puts a lot of emphasize on sustainable communities. As a result, we think that future planning for adequate infrastructure across the state is critical. Land use planning at the regional level is part of that proactive kind of thinking.

We think that needs to involve the local planning bodies as well. I think the issues that came up this morning speak to that. We have supported the importance of corridor planning and designation, partly and largely because of our positions on sustainable communities.

We realize corridors don't just happen. We are supporting the legislation that Senator Simitian has put forth, but actually at this point, we are beginning to wonder whether it will really make a difference.

What does it take to go from talking to actually instituting a process, and I think that question came up this morning, and I think it is very important that it really be addressed. The issues of renewable resources are located is critical, but also the development of desert

communities throughout the state is making the transmission issues all that more important.

Once again, I think we would like to suggest that there be a pilot effort undertaken to try to look at how a process for the development and designation of corridors could take place.

Personally, I have spoken with the Executive Director for the Bay Area Planning Council, I can't remember the name of the -- no, it is ABAG is now meshed with MTC and the Air Board, so there is actually the three bodies are looking together at comprehensive planning.

It was very interesting to find out that they are not including any kind of energy infrastructure planning at anything they are looking at. They are looking at transportation, they are looking at housing, but the infrastructure that may be needed to go along with those is being totally neglected, and we are assuming that is taking place on every level around the state.

I think the information that came up this morning in terms of emissions related to cogeneration was very important and the gaps in that area are critical and should be addressed.

We believe that cogeneration is certainly an important way to minimize our reliance on certain fuels, but some of the information that came out this morning certainly doesn't bear that out.

I have two questions. Chiefly, if I am going to present this to our league members across the state, I need two bits of information. One is whether the 31 percent of out of state electricity is capacity or energy or I want some kind of definition of what that 31 percent really is. I also need a definition in terms of what dedicated coal plants really mean.

So, thanks.

PRESIDING MEMBER GEESMAN: Let me try on both, and staff please correct me if I am wrong. I understood the 31 percent to be an average of energy for the years 2001, 2002, and 2003. I also understood dedicated coal plants to be those out of state coal plants that actually are owned by California utilities or the State Department of Water Resources or the Los Angeles Department of Water and Power or some other muni's.

MS. TURNBULL: The fact that they are owned does not mean that they are base loaded though, or does it?

PRESIDING MEMBER GEESMAN: I think the coal plants ordinarily operate in base load fashion, so they probably are run as if they are base load facilities.

MS. TURNBULL: Thank you.

PRESIDING MEMBER GEESMAN: Other comments from any of the members of the audience?

(No response.)

PRESIDING MEMBER GEESMAN: Great. I thought it was a good day. I want to thank everybody for your participation, and hopefully we will see you all back tomorrow when we take up once-through cooling and avian mortality issues.

(Whereupon, at 2:45 p.m., the workshop was adjourned to reconvene Tuesday, June 28, 2005, at 9:00 a.m. at this same location.)

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## CERTIFICATE OF REPORTER

I, CHRISTOPHER LOVERRO, an Electronic Reporter, do hereby certify that I am a disinterested person herein; that I recorded the foregoing California Energy Commission Workshop; that it was thereafter transcribed into typewriting.

I further certify that I am not of counsel or attorney for any of the parties to said workshop, nor in any way interested in outcome of said workshop.

IN WITNESS WHEREOF, I have hereunto set my hand this 27th day of June, 2005.

Christopher Loverro

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